THE LIBRARY OF CONGRESS

What the Advertiser & Artist Should Know about Reproduction

A review of the different methods of reproducing drawings and paintings from the viewpoint of the requirements of modern advertising

WITH WHICH IS INCORPORATED

Specialized essays by ten of the most noteworthy Engraving houses in America

Edited by
LESLIE KROEGER
of Westinghouse Lamp Co., N.Y.

Compiled and Illustrated by

THE LINNINGS New York

NE850
.L5

Copyright, 1921
by
THE LINNINGS
New York City

JUN 14 1921

©CL.A614724

no 1

TO THOSE WHO SEE
ART AND SCIENCE IN ADVERTISING
AND ARE STRIVING FOR THEIR
DEVELOPMENT, THIS BOOK
IS RESPECTFULLY
DEDICATED

New York, 1921

Index of Chapters

CHAPTER		PAGE
	Introduction	IX
I	A Review of the Different Plates	1
II	Zinc Etchings	7
III	Black and White Problems	15
IV	Half-tone Etchings	27
V	What an Advertiser and Artist Should Know About Half-tones	37
VI	Wood-cuts or Wood Engravings	49
VII	Modern Wood Engravings and Their Purpose	57
VIII	Duplicating Plates	61
IX	What an Advertiser and Artist Should Know About Electrotypes	69
X	Rotogravure Process Printing	89
XI	How Rotogravure Pictures Are Made	99
XII	The Ben Day Process and Its Application	109
XIII	Ben Day Screens—A Logical Process	117
XIV	A Look into Lithography	127
XV	What an Advertiser and Artist Should Know About Lithography	133
XVI	A Talk About Offset	141
XVII	Offset Lithography — The Most Modern Process of Reproduction	145
XVIII	Tint Blocks and Their Practical Use	157
XIX	Color and When	161
XX	The Three- and Four-Color Processes	169

CHAPTER		PAGE
XXI	Complications Connected with Color-plate Making	181
XXII	The Prismatone Process	189
XXIII	The Purpose of the Matrix	197
XXIV	Crayon and Charcoal Drawings	205
XXV	Silver Prints	207
XXVI	"The Reducing Glass"	211
XXVII	The "Bleed" Border	213
XXVIII	Glossary of Terms and Expressions Used by Photoengravers	215
XXIX	A String to Tie Around Artists' Fingers	221

Index to Engravers' Articles

ARTICLE		PAGE
I	BLACK AND WHITE PROBLEMS. A few pointers on the preparation of drawings for Line Reproduction. Warren J. Stoddard. The H. C. Jones Engraving Co., New York City	15
II	WHAT THE ADVERTISER AND ARTIST SHOULD KNOW ABOUT HALF-TONES. Gatchel & Manning, Inc., Philadelphia, Pa.	37
III	MODERN WOOD ENGRAVINGS AND THEIR PURPOSE. Dahl and Sinnott, Hartford, Conn.	57
IV	USE AND ABUSE OF DUPLICATING PLATES, INCLUDING DO'S AND DON'T'S. James R. Crowell, of the Reilly Electrotype Co., Inc., New York City	61
V	HOW ROTOGRAVURE PICTURES ARE MADE. Neo Gravure Printing Company, Inc., New York City	99
VI	BEN DAY SCREENS—A LOGICAL PROCESS. The Walker Engraving Co., New York City	117
VII	WHAT THE ADVERTISER AND ARTIST SHOULD KNOW ABOUT LITHOGRAPHY. Einson Litho, Incorporated, New York City	133
VIII	OFFSET LITHOGRAPHY, THE MOST MODERN PROCESS OF REPRODUCTION. Andrew H. Kellogg Co., New York City	147
IX	THE THREE- AND FOUR-COLOR PROCESSES FROM THE ADVERTISER'S VIEWPOINT. The Sterling Engraving Co., New York City	169
X	THE PURPOSE OF THE MATRIX. The Schaefer Company, New York City	197
XI	A STRING TO TIE AROUND ARTISTS' FINGERS. *The Printers' Ink Monthly*, Copyright Romer Publishing Co.	221

WHAT THE ADVERTISER AND ARTIST SHOULD KNOW ABOUT REPRODUCTION

Introduction

THE subject of Reproduction is of infinite detail, and no one, however skilled in the art, can boast of a complete understanding of every one of its varied branches. The more you know, the more you realize how much there is still to learn.

We are making a real effort to overcome, first and foremost, the problems of those finding difficulty, and, perhaps, no small embarrassment in the pursuit of their daily duties and studies.

Care will be taken not to mystify the reader with trade terms and technical phrases. Whenever practical, of course, there is no better lesson obtainable than a trip through an engraving house, where the actual processes of manufacture can be witnessed and the progress of the work studied as it passes through the various departments.

There is no longer any reason why we should labor under the delusion that the "average reader" pays no attention to good or bad advertising. The idea belongs to yesterday, for the deluge of display has taught the layman the difference between the clever and the commonplace, and has given him the desire to take

more than a passing interest in the various manners and methods of handling advertising and to appreciate technique to the fullest extent. The day has come for the advertiser to insist on the finest reproduction of the cleverest art work, to think up ways and means of adding novelty to campaigns, and to realize that the public is "wise" to "overdone" copy. St. Beauvre, the great Frenchman, said: "Sixteen words in the mouth of one man are commonplace, whereas they are a flash of genius in the mouth of another," and copywriters should hang this as a sign in their department.

In this country the artist finds it difficult to come in contact with the business man any longer than to submit his sketches or finished drawings, and rarely, if ever, is he given a chance to talk seriously about reproduction.

The drawing is generally to be for a halftone, line plate or possibly a combination plate. In many cases, the artist, if he is a good one, could show the advertiser methods of reproduction that would actually save him money. The same is true regarding the relations of the engraver and advertiser. One tries to bluff the other as to how much he knows about engraving; the other often looks out for the process that will net him the most money. An engraver told us recently how Mr. So-and-so of such and such an agency sent in a drawing and an order calling for reproduction in

five colors, Ben Day, and Mr. Engraver was smiling because he knew that it could be reproduced with fewer plates, because he was familiar with the facts that blue and yellow made green, and red and yellow made orange. Everyone in the advertising business feels that each member of the allied branches lives in another world. This is the fault of the system, and it is this condition that suggested to us the writing of this text-book for the direct help of the art buyer, the plate buyer, the student-artist, or any others interested in advertising. It should always be remembered that it is even possible that, although the business man holds the stakes, the artist and engraver are more necessary to him than he is to the artist and engraver, when it comes to the point of reproduction.

An advertisement of The Walker Engraving Company, of New York City, expresses the earnest desire for a better understanding between advertiser and engraver. "We have no patience with the engraver who pretends he's a magician—the purple veil of mystery is old stuff. The more you know about how engravings are made and how long it takes, the better for us. Most instructions (from the advertiser) have to be shaken well before taken."

In offering this book to the art and advertising professions, the writers believe it will have a beneficial influence. It has been the

result of months of close analysis, fifteen years' experience and an earnest desire to furnish both advertiser and artist with a comprehensive text-book without the usual dry taste.

The writers believe that this book will supply a long-felt want, particularly for those who have recently entered the advertising profession.

Our thanks and appreciation we tender to those worthy organizations who have so willingly contributed the up-to-the-minute essays which appear at the close of each chapter.

THE LINNINGS.

110 West 40th Street,
New York City, 1921.

CHAPTER I

A Review of the Different Plates

PLATES, or "cuts," as they are more popularly known, play a big part in the advertising and printing business. Both the artist and the advertiser should possess a working knowledge of their use, and the purposes for which they are best suited. They should also be familiar with the processes employed in their making, the comparative costs of the different plates, the time required for their preparation and other details involved in their handling. Such working knowledge contributes to art, engraving and printing, efficiency and economy.

Until the last quarter of the 19th century, reproductive processes, save as regards line reproduction, can hardly be said to have existed. When it was desired to reproduce paintings and drawings for printing, they had to go through a process of interpretation by an engraver or draughtsman who gave a rendering of the subject on metal, wood or stone. The means at their disposal were dots and lines, which, varying in their thickness and proximity, expressed dark and light passages

in the scheme of light and shade of the original. It will readily be understood how such interpretations would vary. An engraver with fine art instincts would produce an engraving as distinct in character as was the original painting or drawing. Engravings of this type were sought as works of art, and treasured for their artistic qualities. But these engravings took time to produce. Years were devoted to the making of a single steel or copper plate, while wood engravers, who were artists, would only work on a block when in the mood. For this reason publishers frequently had to endure long periods of waiting. They naturally grew impatient and were willing to accept rapid interpretations by men who could produce them under other than artistic conditions. But the pain of the artist at the bad rendering of his original was often great, so that he, not less than the publisher, hailed with enthusiasm the attempts that were being made to reproduce his work by mechanical means. The ideal of the artist would naturally be a reproduction of his work which would retain all of its individual characteristics. To give him this was the aim of the school of wood engravers which originated in the United States. They made a last stand to maintain the position of

→ Page Two ←

their art in the field of book illustrating.

By a system of extremely fine work the American wood engravers were able to keep much closer to the tones of an original than had previously been possible. However, the result was obtained at a sacrifice of the artistic rendering of the best old engravings, and was so mechanical in its character that when it had to compete with a real mechanical process, this class of engraving could not hold its ground. The enormous difference in the cost of production was also a factor of sufficient importance in itself to make it impossible for wood engraving to retain the field. A similar development had been going on in the other branches of engraving. The line engraver and the etcher found themselves faced by mechanical reproductions in plate form, which, while preserving more of the character of the original work, were produced in much less time and at greatly reduced costs. It has thus come about that the last quarter of the 19th century witnessed the dispossession of the hand engraver from the field of interpretative engraving, and the occupation of his position by the chemist and the mechanician.

The term "process," which has come to be applied to all photo-mechanical reproduction,

is a somewhat unfortunate one, inasmuch as it is descriptive of nothing. From time to time various names have been given to its various forms, indicative either of the name of the inventor or some peculiarity of the method involved. Zincography, gillotype, photogravure, heliogravure, heliotype, phototype, albertype, are illustrations of the kinds of names given to the slightly varying applications of the same principle, but usage has come to apply the term "process" to any printing surface that is produced by chemical or mechanical means.

The majority of the modern "processes" are the result of Mungo Ponton's discovery, that a preparation of albumen or other colloid substance and bichromate of potash could be hardened and rendered insoluble and non-absorbent in water by exposure to light. Just as a photographic negative permits the passage of light through it in varying degrees of intensity, so a film of this preparation when placed under a negative was found to harden and become insoluble in degrees varying with the intensity of the light affecting it. This discovery now governs the production of all process blocks or plates.

Speaking of metal plate printing and leav-

ing lithography and its numerous related branches to separate chapters, there are already nine different kinds of plates used in the advertising business. These are also used in combination with each other, making what are known as combination plates, the most common being a combination zinc etching and half-tone.

There are three original plates, namely—Zinc etchings, Half-tones and Wood-cuts, and from these are made six duplicate reproductions used for actual printing, unless the run is very small, in which case the original plate is used. The duplicate plates are termed as follows: Electrotypes, Lead-moulded electrotypes, Steeltypes, Nickeltypes, Stereotypes and Aluminumtypes.

All the different color processes on metal are concocted from these basic plates and the nature of these different cuts and processes, the possibilities of their use and purpose, with some explanation as to the method of their manufacture, are discussed in the chapters that follow.

The wearing qualities of the different plates will make a suitable ending paragraph for this chapter. It is always interesting and very often a mystery just how long a plate will wear, or

how many impressions it will "pull." Presuming that the plates are properly made and correctly used, the medium screen half-tone or line plate will give one hundred thousand or more good impressions.

A fine screen half-tone will not pull more than ten to fifteen thousand impressions, whereas a coarse screen half-tone or a broad coarse line engraving will pull one hundred and fifty to two hundred thousand impressions. The fineness of a half-tone screen determines its life, naturally.

Then there are other conditions which tend to shorten the life of plates, for instance: improper make-ready, too much impression, poor presses, hard and gritty surface papers and the chemical action of some printing inks; however, as a general rule, the above estimate may be taken as authoritative.

CHAPTER II

Zinc Etchings

THE zinc etching is the commonest and most frequently used plate. It is sometimes called a "line cut," "line engraving," or just plain common "zinc."

The prints from zinc etchings come out black and white only or solid color, no tones. They are suitable for any kind of work where the subject can be illustrated in solid line, stipple, masses of black or any single color. The drawing from a zinc cut is always made with solid black ink or paint, but the advertiser should note that it is possible to make zinc plates from red, orange, or dark green subjects, as these colors have a black photographic value on a commercial negative. Light blue has no photographic value on the negatives used in making zinc etchings, so for this reason, it is sometimes used on drawings to indicate Ben Day, or parts of drawings which are to appear in different colors on different plates.

Shaded effects desired in zinc work can be obtained by the artist through "stippling," which is shading with lines or dots, or by the

Ben Day machine. These processes are extremely important ones in the engraving business and are of the utmost value to the advertiser and artist. They are entirely mechanical and enable the artist to obtain different tone values as well as strikingly beautiful effects when used in color work. Some of our best direct by mail folders and illustrated booklets are produced by Ben Day on zinc plates. These are sometimes called "tint blocks" or "tint plates." The advertiser should always insist on the artist providing an intelligent "color sketch" with his black and white drawing for Ben Day color plates.

In many cases it is not enough to mark the colors on the tissue flap of the drawing unless the colors are of a very simple nature. The artist should bear in mind that the man who lays the Ben Day on the plates is also an artist, a Ben Day artist, who is usually apt in helping the artist to provide an attractive color scheme. As a rule the Ben Day man knows more about color than the artist knows about the Ben Day machine. Many an attractive drawing intended for Ben Day color work loses its effectiveness when reproduced, because of the lack of a good color sketch. Serious mistakes are often made, which mean

Zinc etching, commonly called a "line cut." Original drawing was about three times larger. Plate by The H. C. Jones Engraving Co., N. Y.

the making over of plates, because the artist thought the engraver understood that so and so was to be in such and such a color.

There is a wide range of papers upon which zinc etchings can be printed and this is a matter that should be decided jointly by the advertiser and artist. The paper to be used is governed with a view to the amount of detail contained in the design. Fine detail naturally requires a smoother paper than a design which is coarser and has broad flat surfaces. Of course, if the paper is chosen before the artist's work is begun, the advertiser should acquaint him with that fact and furnish him with samples so that his work may be governed accordingly.

The Ben Day process and a description of the machine are in a following chapter.

It is often desirable and sometimes necessary, in order to secure distinctive effects, to reverse the drawing either as to position or color. For example, repeating a design in a reversed position on the opposite side of the page, or making letters appear white on a black background instead of vice-versa. These are known as "reversed plates."

Such reversed plates should always be watched carefully, in order that essential de-

tails are not shown in wrong positions as, for example, a figure writing with a left hand, or a left drive automobile appearing right drive.

Intelligent instructions should be written on the drawing for the guidance of the engraver, such as, "reverse plate and insert as indicated on drawing," or the like.

Zinc or line plates are made by the photo-engraving process, which is fundamentally photographic, and embraces chemistry and physics to a considerable extent.

The following is a brief yet helpful description of the essential steps in the manufacture of these plates. Please note that processes change from time to time and the one here described is authoritatively correct at this time.

The camera sets on a long frame at one end of which is a board to which the drawing is fastened. Both the camera and drawing are therefore held by the same frame, so that jars and vibrations do not affect the focus by changing their relative positions. The camera moves backward or forward in the frame to facilitate enlarging or reducing, as the case may be. The photographer ascertains the focus and size of the plate needed by simply measuring the image of the drawing as it

→ Page Ten ←

appears on the ground glass in the rear of the camera. Powerful electric arc lights are played on the drawing no matter if the work is done during the day or at night, in order to insure a clear strong negative. This negative is then passed on to the dark room man who develops it. Next the film, which is especially prepared from a solution of collodion and rubber, is "stripped" from the glass and placed in a reversed position on another piece of glass to dry.

A plate of zinc having a perfectly smooth polished surface is now coated with a highly sensitized solution. The zinc is then placed in a frame with the sensitized side up and the glass holding the film is placed on the zinc with the film side down. These are now exposed to the intense light of electric arcs. It is commonly supposed that this light prints an image on the zinc, but this is not so. The light, however, acts upon the sensitized plate and the action causes the exposed parts (those not directly under the translucent parts of the film) to develop and adhere tightly to the zinc.

The zinc is now removed from the frame and inked with an ink roller, after which it is developed and washed. The water does not wash the ink from such parts of the sensitized

coating as were acted upon by the light, but all other parts of the plate which were not acted upon by the light, are washed clean, leaving only the first view of the reversed design. The plate is now ready for etching. It is first dusted with what is known as dragon's blood, a fine red powder which sticks to the ink. This is then "burned in" by holding the plate over a flame which causes the dragon's blood to melt, thus forming a protective film over the ink, which makes it acid proof. The back of the plate is made proof by a coating of asphaltum varnish.

The plate is now placed in a shallow tank containing a solution of nitric acid, and by means of a mechanical device the tank is rocked so as to keep the acid eating evenly over the whole of the zinc. Here is where good or bad plate making is proven. The reader will realize that highly skilled labor is necessary to perform all these delicate operations, especially the operation of etching in the acid bath. It will also be seen that all these exacting processes render reductions impossible, below a certain price. When an advertiser pays less for his cuts than is consistent with good workmanship, he probably gets poorly etched plates. As will be seen in the next

paragraph it is easier to etch a plate too shallowly, than to the correct depth, and it is also easy for an inefficient workman to allow the acid to eat under and weaken some lines or let the finer lines be eaten entirely away.

In etching a zinc plate correctly it is not allowed to remain in the acid solution until it has been etched to its final depth, for as soon as the acid has eaten down below the protecting film of dragon's blood and ink, it also begins to eat under the film. If nothing is done to prevent this, some lines are eaten away while others will crumble when put under the pressure of the printing press.

To avoid all this, the plate is given four separate baths or "bites." Between each operation the plate is removed from the bath and redusted carefully with dragon's blood. This keeps the acid eating downward all the time and is the only insurance for good plates, which will stand up under all necessary conditions.

After etching, the plate is passed on to the "router," who "routs" all superfluous metal from the sides and from between such parts of the design as are far apart. This also is a delicate operation requiring a man of experience in order that the fast moving drill does

not cut too close and chip away parts of the design.

The plate is now ready to be "mounted," that is, fastened on a wooden block or other mounting device that makes the printing surface of the plate exactly type high.

CHAPTER III

Black and White Problems

A few pointers on the preparation
of drawings for line reproduction

By Warren J. Stoddard

OF THE H. C. JONES ENGRAVING CO.
New York City

THIS essay is not intended to explain in detail the different processes through which a line plate is subjected in the course of manufacture, but to primarily set forth various methods and treatments which are just as well to know in connection with the preparation of drawings for line reproduction.

How can we ever be sure that drawings made for newspaper use will show up properly when they are printed—will not smudge, fill in? It is the common custom to make originals inordinately large. Engravers think artists are a little off, mentally, because of this. They cannot understand, when there are so many mechanical pitfalls, why an artist will draw a picture twenty by thirty when it is scheduled for a plate five by six. The engraver knows that fine shading will "fill in," he also knows that he gets the blame if results are poor.

REPRODUCTION

An up-state bank required pictures, in line, of the front elevation of its handsome building. Engravings were required, for standard use, one, two, three and four columns in width.

We felt, at the very inception of the order, that one master-original would not do for all of these newspaper sizes. If we drew it refined enough for four column reproduction, it would fill in, in one column. If we drew it to meet the demands of the single column, it would be far too crude for the larger sizes.

But the advertiser would have his own way.

We wanted to prove that two drawings should be made if he was to play absolutely safe.

The drawing was plated in the larger size and in the smaller. Then proofs were struck off on common newspaper stock. The single column plate was a black smudge, as might have been expected. And so two separate illustrations were made, one simple and in outline for single column and one containing far more detail for the larger sizes.

Advertising pictures, as now used, have one fault—there is too much detail.

It's all very well to draw things as they are when you intend to exhibit in a salon, but in advertising we agree with associates of ours who say:

→ *Page Sixteen* ←

"Suppose in writing copy, we followed the rule of the average artist. Suppose we used as many words in writing a story as the art department uses unnecessary detail! What would happen? It would require ten pages for a single piece of text. We have had to learn the use of wise elimination. You folks should learn the same Golden Rule. We boil it down to the fewest possible words. But an artist wants and even demands to use every pen line, every color and every fragment of accessory. People can't be expected to give as much time and attention to advertising illustrations as they would to an exhibition of paintings. Get your thought over quickly, simply and with minimum amount of detail."

The artistry of pen-and-ink renderings has perhaps made a more noticeable stride than other features. By contrast with what was used, they seem positively wonderful.

Here we have developed for us delicate textures and gradations of line, grace and technique and innovation of treatment that rival the efforts of the reading matter pages of the magazines in which they appear.

Yes, advertising has made it possible for the artist to take pride in his work. The subjects are more inspiring. The copy expert delves

deeper into the psychology of salesmanship and, in turn, offers his art collaborator a broad bright field.

It required this outlet, in reality, to prove to us that there were so many interesting pen-and-ink "styles." The true artist can paint with a pen and a bottle of drawing ink. It is possible for him to put his own individuality into the lines.

Compare what used to be with what is and you will find that the advance has been little short of amazing. We marvel now that such crude attempts ever passed muster, ever produced results.

Straight wash may have its defined limitations. In pen-and-ink there really is none. An artist's fancy runs free and unhampered. See what Coll, for example, has accomplished with his pen! Keller, of whom we all know, etches with a two-ninety Gillott. Harry Fenn gives the breath of life to leaves and flowers and quiet woodland hedges and all the glorious weave of Mother Nature, when she sets to her task. Yet, when we stop to think of it, the old masters were apt to play with fine lines and the subtleties of the drawing pen. Who can say that Abbey was not at his marvelous best when tracing out for future generations those

charming, fragile, yet wholly human studies of his pen and ink.

We sometimes rub our eyes in startled bewilderment at the transformation and the juxtaposition of art with commerce. A hulking tractor, all mechanism and steel and grime, is made to seem beautiful — is given sentiment, feeling, even personality. From soap to kitchen cabinets, the genius of the man with the pen puts new and unsuspected romance into salesmanship.

Advertising would be at its wits' end, in the embellishment of the message, without the line plate and genius mixed with black drawing ink. It has always been acknowledged that pen and ink as a medium of expression, allows greater latitude for individuality. Just as no two persons write alike, so, it would seem, the drawing pen and the jet black ink combine to bring out distinctive qualities in an artist's illustration. It is such a mistake to think that black and white, as a technique, prohibits subtleties.

A remarkable drawing paper is manufactured for use by the artist when he wishes to give various imitations in pen and ink of woodcut effects. It has a very hard chalk surface. Paint in a mass of black with ink and then,

with a sharp knife, scratch out any width of white line you wish. It is difficult to make corrections on this paper so be sure you are right before you go ahead.

Of recent years the popularity of the dry brush treatment has greatly increased, due, no doubt, to its easy going, printable and decidedly artistic appearance. Such drawings are made, as a rule, on heavy illustration board, the surface of which is somewhat rough, which gives a resistance to the brush and leaves little open spaces. The engraver need experience no great difficulty in making such plates, provided the brush-marks are black. If they trail off into gray, then he does have his troubles. It has been found expedient to use lamp-black from tubes, rather than ink, for this purpose.

It is best not to make the originals too large —never more than three times actual size, although not all artists, by any means, adhere to this suggestion.

The fusing of photographs with line accessories is only another possibility not used as much as its charm justifies. The accomplishment of this is simple. If a complete photographic subject is to be made over in two values, that portion which is to remain in halftone is neatly silhouetted with scissors or sharp

→ *Page Twenty* ←

knife and mounted on drawing paper. Then the other part of the subject is traced off around it and interpreted in pen and ink. Too much shading is dangerous here. Better results are secured with open line treatment.

An advertising department produced a series of advertisements, in each case a large area of the background was in solid black. Everybody around the shop liked the effect.

It was strong, vigorous, compelling. "It will kill everything else in the publication" was one comment. And in this remark you have the answer.

Most assuredly this form of illustration would do just that, and because it is unfair to other advertisers, particularly on pages where there is competition, many of the magazines either refuse such copy altogether or run it considerably changed by the use of stippling on the plate.

The process is quite simple. By running a grain or dotted tint in white over the solid black, the strength of the original is vastly decreased.

It can be done mechanically by any engraver, and it can be done on the completed plate.

No publication wishes to be unfair to its

advertisers, and when, on a certain page, one advertisement eats up printing ink by the gallon in making a bull's-eye, the advertiser who has taken refuge in no such strong-arm method is done an injustice. Moreover the advertising pages are more or less marred by unsightly blotches of black.

This is not to say that black backgrounds are not valid under certain conditions. It's all in the way you do it.

The advertiser in newspapers takes a very long chance when he makes solid black over large space the keynote of the display, simply because he feels that his advertisement will be stronger than those around it. Cleverness is so much better than printers' ink. It's the idea that counts, rather than the lathering on of black.

Newspapers can't print these big black areas as they appear in the original. More than likely, they will "show up" a dingy, unsightly splotch. Ben Day tints are far more preferable. Fast running presses are unable to distribute the ink evenly—and enough of it.

The effects can be secured, in an exact way, of course, by the magazines, and certain periodicals allow the advertiser to go his own way, passing no censorship and laying down no rules. Black is the oldest known commander

of attention. It is gloomy and forbidding and sinister, but it throws the object out until it dances on the vision and cries for reader-attention. Too much black is funereal and the color psychologist will tell you that just as green suggests envy, red passion, blue innocence, etc., black is a breeder of gloom. That is its characteristic, its message.

Very often a spot of black in a composition will enrich and brighten the advertisement. It is effective when demonstrations are necessary, or when objects must be brought out sharply, distinctly, against no particular accessory backgrounds.

Where periodicals are sure to cut down the strength of black, regardless of the plate you send in, it is much better to do it yourself in advance, then you will know what will happen. Some strange stories are told of stippling and Ben Daying left to the tender mercies of the publication. Why take this chance?

The artist can himself approximate solid black in backgrounds. He can leave occasional patches of white dots. He can imitate the old-time wood-engraving. He can vignette his blacks and make them come well within the magazine ruling. Or the engraver can be given a Ben Day screen and asked to attend to

graying the solid areas. Never leave it for someone else to do. When these hurriedly done Ben Day patterns cross white lettering, there is sure to be trouble. Legibility ceases on the spot.

Printers are afraid of a wide expanse of black for technical and mechanical reasons. If a speck of dust or a clot of ink or any foreign substance happens to reach the plate, it sticks there and a number of impressions are run off, marring the background. Presses must be stopped and the obstruction cleared away. This might happen to almost any plate, but where there is a great deal of black it is doubly noticeable.

Give first consideration to the idea and thought behind an illustration rather than its technique.

Black is not a sales agent by itself.

Black, injudiciously used—and comparatively few know how to use it—does more harm than good.

Never, never use white text on a solid black background, unless it be a name plate or a short title.

You can achieve sensational and striking results without solid black.

It is the dynamite of display. Dynamite is

useful at times. It can be made to accomplish serviceable purposes, but people who fool with high explosives should know all about them.

Seven or eight years ago an art institute, advertising extensively, put out a single column display in which the silhouette head of a charming child was the main feature. There have been several experimental changes, but the original advertisement seems to have stood the test of time better than anything they have used. For the silhouette does not grow tiresome. Much can be said of this form of commercial art favorably on the score of compelling reader-attention within the law of competition. A few seasons ago a manufacturer of very fine writing paper employed a woman to draw twelve silhouette pictures for half-page space. They were interlaced with fine line decorations of the French school, and the period borders were studied out with infinite care. These black masses emphasized the sparkling white sheets of paper, and no campaign of that year attracted more favorable comment.

Are there intricacies connected with the production of silhouettes? Are they any more difficult to secure than other art expression? Is there some trick or knack?

→ *Page Twenty-five* ←

These questions are frequently asked. The silhouette is far less expensive to produce than the commercial art design of common practice. Once the outline is drawn there remains only the filling in of the ink. First, however, must come a scientifically and accurately sketched skeleton of the figure, face or landscape. The fact that they are solid black does not mean that poor draughtsmanship can be concealed.

An artist must be an efficient student to make a silhouette. That no detail is allowed seems to increase the need of outline accuracy and super-drawing. Introduction of interrupting whites and grays, detracts rather than adds to the charm of the silhouette. It should not be mongrel.

After suffering the tortures of poor printing with half-tones on farm-paper and newspaper stock, the Joseph & Feiss Company, makers of Clothcraft Clothes, hit upon the silhouette and found that the style story could be told in a remarkably clever way.

And so it goes—chapters could be written on the wonders of the ink bottle, the flexible pen and the zinc plate. Certain it is that from them originate many of the most novel and original effects of advertising.

→ *Page Twenty-six* ←

CHAPTER IV

Half-tone Etchings

HALF-TONE work introduces the use of the photographic screen in reproduction. There are very few in the advertising and allied professions who have not at least heard of a screen. There seems, however, to be some kind of a mystery surrounding its use, and the writer has heard more than one advertising man refer to screens as some college boys refer to Algebra—they understand all about it—but?

This chapter will possibly help somewhat to clarify existing difficulties of a few who are uncertain on the subject.

The drawing or object to be reproduced is photographed through a screen consisting of a heavy plate of clear glass, accurately ruled with fine black lines both vertically and horizontally, and of a certain number to the inch. The screens in use at present vary from 55 to 400 lines to the inch, but anything over 175 lines is considered very delicate and can only be used for the very finest of coated stock and must be printed very slowly to be of advantage. The proper balance between paper stock

and half-tones must be ascertained and maintained. The screen is located in the camera immediately in front of the negative so that the negative is exposed to the drawing through the screen. The result is that the drawing or copy is photographed in dots which equal in weight and strength the tone values of the drawing. When the negative is transferred and the finished plate made, these dots constitute the printing surface. Each gradation in tone, except white and solid black, is obtainable, but the white of the copy appears a very light gray and the black almost but not quite solid. The process for securing pure white and solid black costs more than for a straight half-tone, but where it is desired, the "High Light" process will overcome these seeming half-tone drawbacks. In making a high-light half-tone, the engraver combines two half-tone negatives, one under exposed, and the other over-exposed. Then by registering the two negatives, the softest tone and the strongest shadows are portrayed. The pure whites on the original are automatically cut clean on the plate, and the whole process gives a faithful reproduction, even to the most delicate pencil lines. In some cases where hand-work on a straight half-tone plate would not cost more than high-light

→ *Page Twenty-eight* ←

plates, it is quite satisfactory to have the pure whites "tooled" out by the engraver (but this should be first ascertained). By this means the light gray portions which should be white are made so by cutting out the screen. This work requires great skill and care and is done by hand with fine instruments by an engraver who holds the plate under a magnifying glass. The darker portions of the plate can be "burnished" to intensify the black, or "staging" may be done in the acid bath by means of which certain parts of the plate receive extra treatment to bring out certain effects. This of course, involves extra time and expense, factors which, of course, must be considered by the advertiser.

Half-tone plates are made from photographs or wash, pencil, crayon or charcoal drawings and from paintings that have good photographic value. They may also be made direct from the object if it is sufficiently flat to be focused sharply by the camera.

When making half-tones from photographs they should be sharp and clear. The clever retoucher can bring out the different tones, smooth out irregular surfaces and strengthen shadows and outlines, correct any faulty lighting, remove objectionable or distracting parts

and emphasize the more important details which the camera may fail to bring out. It should always be remembered that the engraver cannot put into a half-tone any more than is in the original picture and a little is usually lost in reproduction by softer contrasts and the weakening of finer detail. The retoucher is a very important person. He can, in some cases lend tremendous advertising power by a subtle centering of the attention on the selling point of the article.

Wash drawings are used where a photographic effect is desired and one of their principal uses is the making of "bird's-eye" views of buildings, factories or groups of buildings where actual photographs cannot be advantageously employed. These are made by an artist from a number of photographs of the buildings. He determines first a desired "prospective point" and then combines the photographs in one bird's-eye view, but it is not quite so easy as it sounds. It requires the artist to have a working knowledge of the principles of perspective and a display of common sense and patience. The latest method of making a real bird's-eye view picture is to actually have one taken by an experienced airplane photographer from an altitude suitable to the range required

65-Line Half-tone
Outlined

85-Line Half-tone
Lined

133-Line Half-tone
Outlined

175-Line Half-tone
Outlined

Illustrating commonly used screens and methods of finishing plates. Half-tones by Gatchel & Manning, Inc.

for focusing the plant or factory buildings. Many an enterprising firm has made a business of this kind of photography. Architects' sketches and blue prints of buildings before their construction, are also convertible by the experienced artist into very fine wash drawings that give the actual impression of the finished building before even the foundations are constructed. This work is always given to the artist who makes a special study of building construction as applied to illustration and the half-tone is generally the plate used for the reproduction of this type of work.

The process used in the making of half-tones differs somewhat from that used for making line cuts (or zinc etchings) as described in the preceding chapter. After the half-tone negative has been developed, it is treated in the same manner as the negative for a zinc plate; dried, stripped, reversed, remounted and so forth. It is then clamped on a sensitized plate of copper of a very fine grade. The negative and plate are now exposed to the arc lamps, as previously explained and the sensitized coating developed and made to adhere to the plate. The plate is then taken from the frame but is not inked as in the case of the zinc etching, as the sensitized coating itself offers a sufficient protection

against the action of the acid in the places exposed to the light. The plate is now held over a flame and "burned in," thus giving all parts not to be etched, a hard enamel like surface which will effectually resist the acid solution. After the back of the plate has been coated with asphaltum varnish, it is placed in the etching solution, which, for copper plates is a solution of iron. Only one etching or "bite" is necessary instead of four, as in the case of zinc plates. After the first "bite" the plate is called a "flat half-tone," but the expensive part of the process is yet to be executed. Good half-tones require a considerable amount of attention and hand work beyond the simple treatment in the acid solution and the engraver must spend a lot of time and skill to endow the cut with its capacity for printing. Advertisers should beware of the cut-rate half-tone maker, for in many instances, he will supply "flat half-tones," which will not print well.

Half-tones of the coarser screen variety can be made on zinc. In fact, in the early days, zinc was the only metal used for plate making, but experience has shown that, though more difficult to etch to the necessary depth, the closer, denser texture of copper is much better and more suitable for the production of half-tone plates.

HALF-TONE ETCHINGS

It is well to understand the different styles of finishing half-tone plates to be able to intelligently specify the style best suited for a given purpose.

Unless otherwise specified, the "square" finish is furnished, that is, the screen surrounding the design or whatever it may be, is left intact. The cut may be square, oval or any other particular shape.

A "lined half-tone" is edged with a fine black line around any of the previous shapes specified above.

A "Vignetted half-tone" is etched so that the impression gradually fades away along the edges, leaving no distinct outline.

On a "silhouette or outlined half-tone" the screen is entirely cut away from the design so that only the illustration prints. Some advertisers get confused between this and a vignetted plate, believing that when the screen surrounding the design proper, is routed away, it is "vignetted." This is not so, they really infer silhouette or outlined plates.

It seems that the chief difficulty experienced in the use of half-tones is that too much is expected of them in newspaper work. If we could only sit down and examine a half-tone plate under a magnifying glass, we should

then get a faint idea of its minute construction. There are millions of tiny dots of different sizes, and each dot must print a clean sharp impression in order to get a faithful reproduction. Did you ever examine newspaper stock under a magnifying glass? Do so and you will wonder how a half-tone can print on it at all. Newspaper stock is the poorest that is used in printing, and there are slim chances of it getting any better. It is a wood pulp stock, yellow, blemished and porous and to add to these difficulties it is usually raced through the printing press.

Never has the advertiser been faced with worse printing conditions in newspaper plants than at the present time and although there have been numerous suggestions advanced as to the standardization of newspaper printing methods, so that the advertiser could depend on certain definite results, we are afraid that these will never come to pass.

Successful reproduction from half-tone plates is largely a matter of "make-ready;" that is the method the expert printer has of "building" the plate up with thicknesses of paper pasted on the underside. The printer can make certain parts of the picture light and others dark, at will. It requires time of course,

Highlight half-tone engraving. Screen purposely left on face and hat

but the value of make-ready cannot be over-estimated.

On certain high-class magazines, make-ready is practiced to some extent but the newspaper half-tone receives no such thoughtful attention.

Close examination of the nature of a half-tone plate will convince the user that the printing surface of the paper must be reasonably smooth. A half-tone plate must be given a fair, square, fighting chance. Line engravings and all other forms of reproductive plates have their own troubles, but the half-tone seems to have more than its share. It is expected to print on uncivilized paper in many cases. Who would think of trying to print a process color subject on news stock, yet these plates are practically the same as half-tones? Some advertisers may claim that they have been able to "get away with it"—sometimes, but such men have not used many different newspapers.

The following are a few more reasons why the half-tone cannot be expected to print uniformly or at all on newspaper stock.

A plate may "go bad" due to a variety of reasons.

Bad weather will affect ink and rollers.

Dampness will get into the pores of the stock.

Dirt may clog the fine mesh of the plate at any time during the operation of the press.

Ink cannot be kept uniform, it thickens and thins out unexpectedly.

The plate very often loses considerably through electrotyping, especially when the newspaper does not take reasonable care in this department.

Last, but not least, the speed at which the newspress runs is evidence enough.

Ask some old timers how fine a screen to use for half-tones in newspapers. Ten chances to one they will say 65 is the limit. One experienced engraver insists that a newspaper half-tone must be "brutalized."

The trouble lies in the existing conditions of paper and production and the half-tone can't beat it. We doubt if it ever will.

CHAPTER V

What an Advertiser and Artist Should Know About Half-tones

By

GATCHEL & MANNING, INC.

Philadelphia, Pa.

A HALF block from our window sits a man producing the world's greatest weekly—one man. A half mile away sits another man who has been feeding the world with locomotives—one man. The possibilities of one man are limitless when his brain is supplemented by the brains and efforts of countless others—and when he can look on the work of those others and *see* that it is good.

What should an advertiser and artist know about half-tones? Everything.

He should know their possibilities and their limitations, for they have very definite limitations. He should know how they are made and how best to use them. He should know their history so he may aid in their development. A rather big order. We're dealing with a rather big man, for there is today and never has been a bigger man than the true advertiser and artist.

REPRODUCTION

It would be foolish to try to really cover a big subject in the short stretch of this article. We can only emphasize what a monumental thing even the smallest half-tone dot really is.

Photoengraving is a self descriptive term, easily understood. Half-tone is not so clear nor so accurate.

The principle of the camera was early applied to the making of drawings. In mediaeval times we find Porta using it in his sketches of the canals of Venice. But not until very recently, long after Daguerre used it for making portraits, was it applied to engraving, and then only for line engravings.

Just what takes place when a sensitized plate is exposed to light and later developed, or rather why it takes place, most photographers admit is a mystery. But the same principle that governs the size of shutter and length of exposure logically developed the screen basis which today enables us to reproduce so-called half-tones.

It is well for the advertiser and artist to remember that half-tones, whether in one or many colors, are never reproductions but simply approximations. Line engravings are the only true reproductions and even they are more so in theory than in fact unless most care-

→ *Page Thirty-eight* ←

fully made under ideal conditions. A comparison of a half-tone with the original from which it is made illustrates this quite clearly. The finer the screen the closer the approximation.

A half-tone is made by the use of a ruled screen. These screens range from 60 to 200 lines to the inch for general commercial uses and they are placed between the lens and the photographic plate which we are to make our negative. The idea is to break up the surface into different sized dots, as the various gradations of color in a drawing or photograph cannot be transferred by any method to a sheet of copper and etched. The various tones must be changed to either lines or dots so as to make a printing surface for the ink roller of the press to operate upon. The dots are of the varying sizes, ranging from a minute stipple to a solid black and present to the eye the same general effect as the unbroken tones of the copy.

The nature of the half-tone plate made necessary a perfectly smooth surfaced paper on which it was to be printed. To secure this surface a "filled" or "coated" paper was developed, usually by filling the surface with clay and glazing it. Most such papers of necessity crack when folded, and discolor and turn brittle as time passes. This is one reason why

many lovers of books dislike half-tone papers and use whenever possible antique finishes, hot pressing them for any half-tone illustrations required. However, this is far from necessary for ordinary commercial purposes, as every year sees an improvement in the printing possibilities of our standard papers, and a corresponding improvement in photoengraving.

Those of us who lived through the early days of photoengraving remember the tedious tooling that was done after the plate was made, tooling that put photoengravings in much the same class as wood cuts so far as actual hand work was concerned. Today just as careful attention is required to secure the finest engravings, but the reetching is now done to deepen some tones and lighten others. Consequently the main reason for half-tones, photographic exactness, is preserved and emphasized rather than altered to suit the old time engraver's whim.

When we say photographic exactness we have mentioned the main reason for the half-tone. While because of its screen nature the half-tone repeats but a portion of the copy from which it is taken, it repeats that portion with absolute fidelity. It is possible to trick the

human eye. But you cannot trick the eye of the camera. Artists, for instance, must remember that white, seemingly lost in mixing their colors, will be detected and brought out by the lens. It is therefore important for an artist in making wash drawings for half-tone reproduction or in retouching photographs from which half-tones are wanted, to prepare his copy with the idea that a strong light before the lens of the photoengraving camera will detect and transfer to the negative those imperfections of color that are not detected by the eye.

It is particularly noticeable that white affects the lens of the camera in whatever combination it may appear on the drawing or photograph and it will pull the white out to a much greater strength than it appears to the eye.

Quite naturally the most important object is to produce a drawing that will please the artist, and as most half-tones are made for some commercial use, the customer. But in securing this pleasing result he must pay particular attention to the photographic value of the color which he uses. Unfortunately, there is no rule which may be laid down to be faithfully followed to produce copy for reproduction, and after all it is the knowledge gained

by experience which is going to be the most useful to the artist. The cleaner and purer the colors used the more apt is the reproduction to be faithful. As has already been hinted, the use of white is dangerous; pure wash either in black or sepia should be used, letting the white paper serve as the high light and creating the shadows and deeper tones by repeated washes of the same color. Wherever white is used it must be remembered that the camera lens will pick it out in a value which cannot be detected by the eye.

The method of making half-tone negatives precludes the possibility of positively securing the high lights and shadows correctly and still carrying all of the intermediate tones, and on that account it is necessary to have the half-tone negative through photography include all of the possible details with as much high light as possible. It is on this account that re-etching of the half-tone engraving on copper is necessary. It is also the reason that copy should be made with due regard to the photographic value of the various tones. Anyone who is at all familiar with photography knows exactly what under or over exposure will do to your subject, and in half-tone reproduction the same principles apply.

→ *Page Forty-two* ←

HALF-TONES

As it is necessary for the photoengraver to know the purpose for which the half-tone is to be used so that a proper screen may be used to properly print on the paper selected, so it is necessary for the artist to understand the purpose for which he is creating copy. Quite naturally in making a wash drawing for use on coarse paper a different treatment of detail would be given than copy which was to be printed on a highly enameled surface. The ordinary half-tone, of course, is useful for a reproduction where there are tones all the way from black down to the lightest gray as applied to single color engraving.

Of course, there are a great many different kinds of half-tone engravings, such as high light half-tones which are usually made from pencil or crayon copy and where the whites are usually dropped out, and the grays vignetted to nothing; and there are the double print half-tones where the negative is used in combination with another. Then, too, half-tone negatives are often used in combination with line negatives, but it would, of course, be impossible in so short an article to go into the details of the various forms.

Half-tones are also used to be printed in combination with the other where the three

primary colors are used to secure the full color result. This process is known as the three-color process. Assuming that every color is some combination of yellow, red and blue, the problem is to make a half-tone printing plate for each of these three colors with the color values in the plate so that when the three are printed in exact register one over the other, the varying color values will blend so as to reproduce the original.

One half-tone negative is made for each of the three colors. As in the case of a single color half-tone negative, the camera lens detects what tricks the eye. For instance, when the red negative is made a color filter is placed at the lens which separates from the colored drawing or painting, all of the red rays; i. e., the camera detects what is not obvious to the eye whether these rays be of pure red or any part of orange or purple or any of the other tones of which red may form a part. In like manner the yellow and blue plates are made through the proper color filter, their values being separated and transferred to the negative.

Four-color process plates are made in the same way, the fourth color usually being black.

This seems entirely mechanical, but as a

matter of fact, the result of color engravings depends upon the skill of the color engraver. Inasmuch as no pigments used in printing inks are absolutely pure, it is easily understandable how there will be a noticeable difference in the finished result when these various pigments are united. The result is usually only the basis for further development.

The faithfulness of the reproduction of the color copy now depends upon the reetching. Here the manipulation of these negatives printed on sensitized copper makes possible the beautiful color printing results so familiar to us.

As far as the artist is concerned in drawing colored copy, there is no definite rule which may be applied. The camera tells the truth and is always unsympathetic; it will always pick out the actual pigments of the various colors so if an artist applies a thin wash of another color over one which he has on his drawing which does not please him entirely, the unfailing camera lens will detect it.

There are certain limitations, of course, to the color process work, the principal ones being that opposite qualities of the same color should not be used in the copy. If, for instance, in the same copy a cold, dark green is used and also

a yellowish green, both of these greens cannot be produced with fidelity by photographic means. In such cases you can only hope for an approximation of the copy, and while a splendid picture will likely result it is not always as faithful a reproduction as might be desired.

If white has been mixed with a color used in copy the camera will detect it, and quite possibly make impossible the proper use of the three-color process.

The advertiser and the artist alike must both realize that photo-engraving, while a mechanical process, is only mechanical up to a certain point. This is particularly true of color reproduction. The human factor is after all what finally determines the final result.

Every artist realizes that without photo-engraving his field for the use of his productions by the advertiser would be quite limited. The advertiser realizes that without photo-engraving there would have to be quite different vehicles to carry his advertising messages to the American public than now exist.

Contemplate for a moment the tremendous mass of informative, educational and recreational publications which are so positively necessary to the thought and progress of the nation. Each publication vies with the other

to secure from the reader the greatest possible attention so that the circulation may be builded to a maximum to benefit the advertiser who buys space in the columns of these great market places. Most every one will agree that every form of literature in quantity has put within the reach of the advertiser for the American public, illustrative means which reduce the cost of marketing and the consequent ultimate cost to the consumer.

To an engraver there is much missing from this short survey of half-tone. Purposely it has kept away from any description savoring of the technical. The successful use of half-tone depends on the same things that success in any other line depends on: one man, knowing what he wants, and knowing when he gets it.

CHAPTER VI

Woodcuts or Wood Engravings

THIS is really the art of engraving on wood, by lines so cut that the design stands in relief.

This method of engraving was historically the earliest, done for the purpose of making impressions upon paper or other material. It is natural that wood engraving should have occurred first to the primitive mind, because the manner in which wood cuts are printed is the most obvious of all the kinds of printing. If a block of wood is inked with a greasy ink and then pressed on a piece of paper, the ink from the block will be transferred at once to the paper. Now suppose that the simple Chinese who first discovered this was ingenious enough to go a step further. It would evidently occur to him that if one of the elaborate signs or characters, each of which signified a word or thought, was drawn upon the block of wood in reverse, and then the whole of the white wood cut away to leave the sign in relief, an image of it might be impressed on the paper much more quickly than the sign could be copied with a camel hair brush and ink.

No sooner had this experiment been tried and found to answer than block-printing developed and from the printing of signs to the printing of rude pictures of things exactly in the same manner, the step was so easy that it must have been made insensibly.

Wood engraving, then, is really nothing but the enlarging or improving of that primitive block-cutting which prepared for the printer the letters in relief. The only difference between the modern woodcut and the first rude Chinese letters, is a difference of artistic skill and scientific knowledge.

The earliest wood engraving consisted of outlines and white spaces with smaller black spaces, cut with a knife, not with a graver, and shaded lines were rare or entirely absent. Before passing to shaded and modern woodcuts we may mention a kind of wood engraving practiced in the middle of the 15th century by a French engraver (often called Bernard Milnet, though his name is a matter of doubt), and by other engravers probably a little earlier. This method is called the "crible," a word for which there is no convenient translation in English, unless we call it "drilled." It means riddled with small holes, as a target may be riddled with small shot. The effect of

light and dark is produced in this kind of engraving by sinking a great number of round holes of different diameters in the substance of the wood, which, of course, all come white in the printing. The effect produced is a sort of stippling in white. When a more advanced kind of wood engraving had become prevalent, the "crible" was no longer used for general purposes but it was retained for the backgrounds of decorative wood engraving, being used occasionally in borders for pages, in printers' marks and other designs, which were survivals in black and white of the ancient art of illuminating. Curiously enough, this kind of wood engraving, though long disused for purposes of art, was in recent times revived with excellent effect for scientific purposes, mainly as a method of illustration for astronomical books. The black given by the untouched wooden block represents the night sky, and the holes, large or small, represent in white the stars and planets of greater or lesser magnitude. The process was perfectly adapted to this purpose being cheap, rapid and simple. It also has been used in a spasmodic and experimental manner by one or two modern engravers.

Early wood engraving was much more con-

ventional than it has become in more recent times, and this very conventionalism enabled it to express that which it had to express, with greater decision and power. The wood engravers in those days were free from many difficult conditions which have hampered their modern successors. They did not care in the least about aerial perspective, and nobody expected them to care about it. They did not trouble their minds about local color but generally omitted it, sometimes however, giving it here and there, but only when it suited their fancy. As for light and shade, they shaded only when they wanted to give relief, but never worked out anything like a studied and balanced effect, nor did they feel any responsibility about the matter. What they really cared for and generally attained, was a firm, clear, simple kind of drawing, conventional in its indifference to the mystery of nature and to the poetic sentiment which comes to us from that mystery, but they were by no means indifferent to facts of the decided and tangible kind.

In recent years the position of wood engraving has wholly changed. Up to 1880 and for a little while longer it was the chief means for illustrating books and newspapers and a fre-

quent method of fine art reproduction, but by the beginning of the twentieth century it had been almost entirely driven out of these fields by process work of various kinds. However, it still flourishes in its commoner style for commercial and mechanical work, and it is still occasionally maintained in its finest forms by some sympathetic publisher who deplores and would arrest its decay. But the photograph and its facsimile reproduction have captivated the public who want illustration and not art. The great body of the old-style wood engravers have therefore found their occupation entirely gone, while the minority have found themselves forced to devote their skill to retouching the process block, sometimes carrying their work so far that the print from the finished block is a close imitation of the old wood engraving.

But the advantage of engraving by process is not solely due to considerations of economy. The apparent truthfulness claimed by the photograph over the artist's drawing is a factor in the case, but the public is apt to forget that a photographic print shows us what an object or scene looks like to the undiscriminating lens, rather than how it appears to the eyes of the spectator, who unconsciously se-

lects that part of the scene which he especially desires to see. The rank and file of the engravers—even those who could "engrave" after a picture as well as "cut" a "special artist's" sketch—succumbed not only to the public, but to the artists themselves, who frequently insisted upon the process block for the translation of their work. They preferred the greater truth of outline (though not necessarily of tone), which is yielded by process, to all the inherent charm of the beautiful (and expensive) art of xylography.

This process woodcut can be used where long runs are necessary as the deep, angular grooves make it easy to produce any number of electrotypes, all of which are exact duplicates of the original cut.

The chief value of the modern woodcut lies in its adaptability for use on cheap and thin paper stock and at the same time gives all detail necessary to illustrate certain articles. It may be easily and quickly printed on any quality of stock, and can be of the utmost value to the mail order house. Big issues of catalogues are now distributed, which show the use of woodcuts to a large or small degree by practically every department. They are quite satisfactory for illustrating nearly every

→ *Page Fifty-four* ←

kind of merchandise except dainty materials (they have a tendency to be a little too stiff for this work) but on the other hand, they make excellent furniture cuts. The possibility of using light paper makes possible a saving in both stock and postage and this asset, combined with the printing value of the woodcut, has earned for it a worthy position in the field of reproduction.

Showing the adaptability of the wood-cut to the fashion drawing. Courtesy of Dahl and Sinnott

→ *Page Fifty-six* ←

CHAPTER VII

Modern Wood Engravings and Their Purpose

An essay by

DAHL AND SINNOTT
Hartford, Conn.

MANY methods are used for illustrating, each method being the most satisfactory in its own particular field, and every process is limited to its own sphere of usefulness.

The half-tone and other photo-mechanical processes are the most widely used. They are, however, often resorted to where some other process would be more advantageous.

Wood engraving is recognized as having a distinctive place in modern commercial illustrating, because of certain excellent qualities not found in engravings made by any other process. In recent years a keen appreciation of art and craftsmanship as applied to illustrations, especially of commercial and mechanical work, has made itself evident, in consequence of which, the demand for high-class wood engravings for catalogue work has been limited only by the scarcity of artists

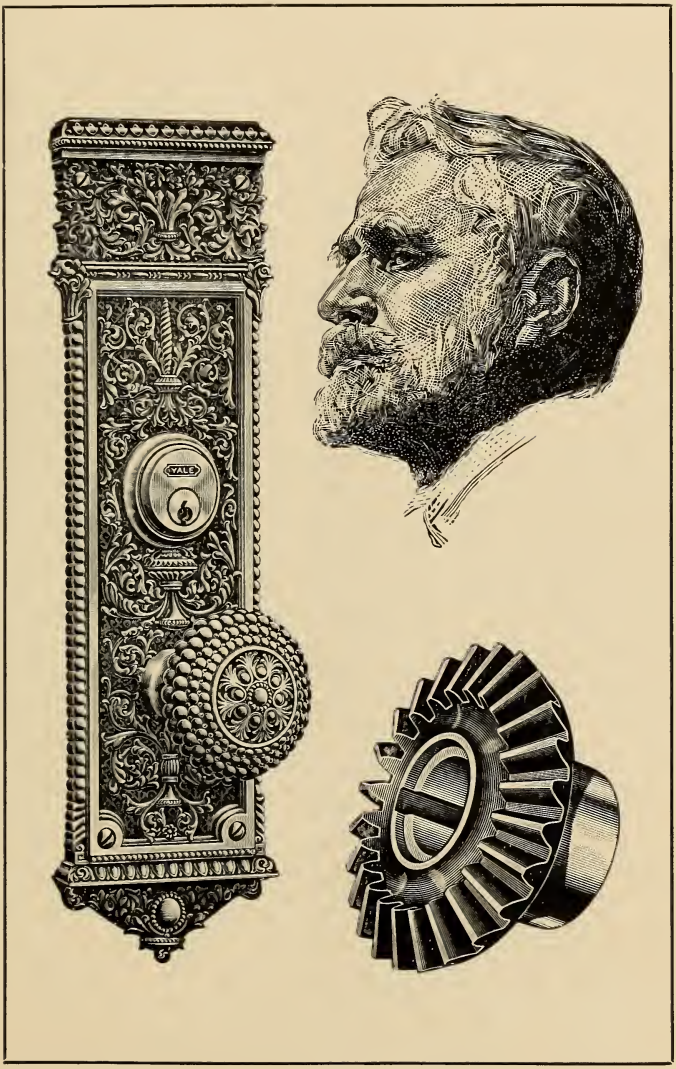
competent to execute it. Large catalogue houses have found the wood-cut to be the best and most economical medium for illustrating, where "long printing runs are required."

Wood engravings are deeply cut, and can be used not only on highly finished papers, but on machine-finished papers or even rough-faced stocks as well. For this reason certain stocks are rendered available which heretofore were impractical to use.

The Turkish boxwood has been found to be the most satisfactory material for the engraver, as it is close grained and cleaves nicely at the point of the tool. The best quality is cut from trees over five hundred years old and which grow along the southern shore of the Black Sea. African and South American boxwood have been tried, but owing to their rapid growth in these moist countries, the wood is coarser grained, and therefore is not suitable for high-grade cuts.

Printing is seldom done direct from a wood-cut, but is done from electrotypes made from the wood-cut, as the wood is not of the hardness to withstand over a thousand impressions without the fine lines becoming worn.

The electrotypes made from the wood-cut original are exact duplicates, because of the



Specimens of wood engraving, by Dahl and Sinnott, Hartford, Conn.

deep and open lines by which the wood-cut is produced.

Different sized illustrations can be readily made from the proof of the wood-cut by reproducing them by the zinc or copper etching process, thus saving the expense of having entirely new wood engravings made for every size desired.

The comparative expense of high-grade wood engravings is often less than that of half-tones, which require large and expensive drawings in order to correct the faults incidental to the process, by which the half-tone plate is produced.

All that is necessary for the skilled wood engraver to use as copy is an ordinary plain photograph of the object to be illustrated, as the character, fine details and color scheme are developed during the process of engraving.

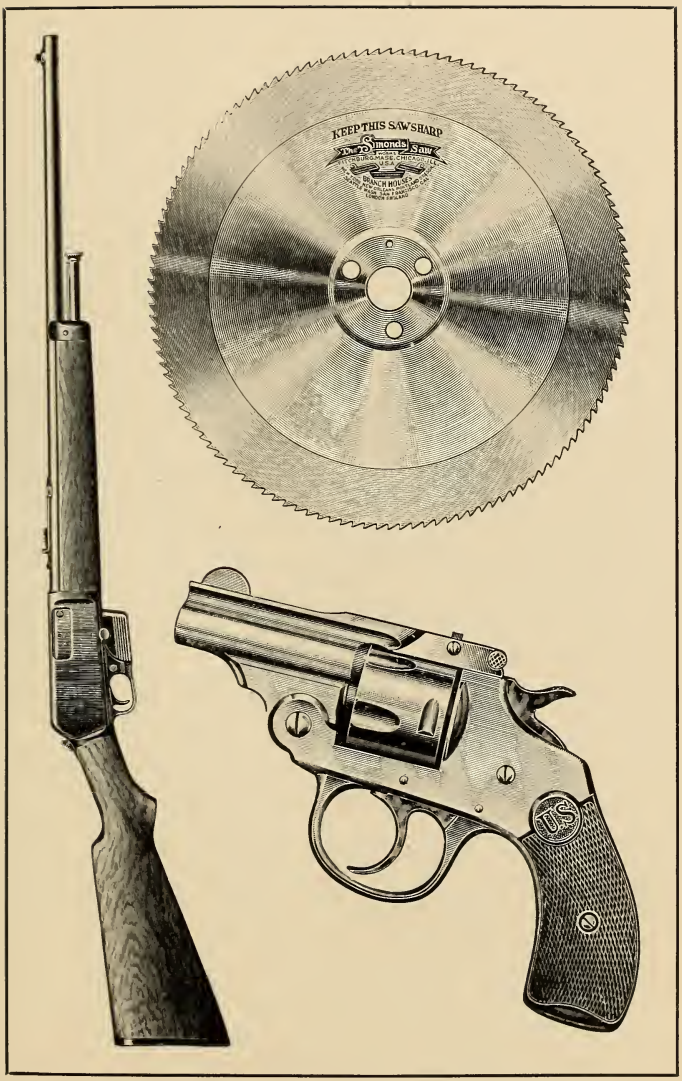
In cases where large numbers of engravings are to be used in the catalogue, it is desirable for the engraver to work directly from the object, where that is possible, so that more faithful reproductions may be secured.

Many concerns are at the present time using half-tones for their de luxe catalogues and wood or zinc cuts for printing on poorer grades of paper found in trade journals, etc.,

whereas wood-cuts could be utilized for both the high-grade catalogues and for printing on ordinary stock.

The skilled and experienced wood engraver can, with a few appropriate tools, produce any effect desired in an illustration. The wood-cut can properly be called a full-toned illustration, as the engraver has at his command a range of color from the solid black to the purest white with all the intermediate tones. He can also resort to a great variety of techniques, such as lines of various degrees of boldness and direction, cross-lines or stipples which may be used to produce almost any conceivable effect.

Accompanying this article are reproduced some examples of illustrations made by the modern wood-engraving process. Particular attention is called to the fine detail and the brilliant effects produced, and where it appears the wood engraver has succeeded in overcoming certain crudities long considered incidental to the old style wood-cut. The use of engraving presents an unusual opportunity to lovers of craftsmanship, and advertisers who wish a pleasing and conspicuous novelty in illustrating.



Specimens of wood engraving, by Dahl and Sinnott, Hartford, Conn.

CHAPTER VIII

Duplicating Plates

HAVING digested the fundamental principles of the original plate making, we come to the point of duplicating them for long runs and hard usage. It is impractical to print large runs direct from type or original plates, because the metal is too soft to stand the wear. We must, therefore, resort to electrotypes, nickeltypes and the like, and we propose in this chapter to give an insight into the uses and methods of making such duplicates.

Starting with the electrotype, its purpose is to reproduce original plates or type for actual printing purposes. Electrotypes as a rule should stand a run of one hundred thousand impressions, and the advertiser can base his needs on this figure. They are also used when several cuts of the same subject are required for supplying jobbers, retail merchants or other representatives with plates, or where the advertiser has to supply cuts to numerous publications. Advertisements set by professional adsetters must be electrotyped for the reason that the type cannot be taken away. In this event the work of electrotyping is taken care

of by the ad-setter who has as many electros made as instructed by the advertiser.

Electrotypes made from zinc etchings and woodcuts are nearly as good for printing as the original plates, and are more durable. Although it is often done, an electro should not be made from an electro unless the original plate is not obtainable, because such electrotypes are not, as a rule, satisfactory. The original or master plate should always be used for electrotyping when obtainable.

The principal methods used in making an electro are as follows. The first operation is the moulding of the original plate or type form in a mineral wax. Next, the surface of the mould which is to be copper-plated is polished with graphite by the "black leader" machine, and then the mould is placed in a bath consisting of blue vitriol, sulphuric acid and water, where it is subjected to an electric current.

In this tank a large piece of copper is hung to the anode, or positive electric terminal, and the wax mould is suspended in the solution from the cathode, or negative electric terminal. By the action of an electric current passing from the anode to the cathode, through the solution or electrolyte, particles of copper are removed from the piece of copper and de-

posited upon the wax, thus forming a shell of copper on the wax mould.

The time required for this action is from three to ten hours according to the thickness of the shell desired. The shell is now removed from the casing with hot water and washed with muriatic acid, after which strips of tin-foil are placed on the back. It is then put into a casting pan and placed over the metal pot, where the tin-foil is melted, backing-up the entire shell. Hot metal is then poured into the pan, thus forming the plate in a rough stage. The plate then goes to the finishing department where it is routed and trimmed down to the proper gauge and the printing surface is properly leveled. It is next polished and prepared for mounting.

Electrotypes are mounted in three different ways, on wood, metal or on a patent base. Wood is generally used and is satisfactory for most purposes. However, for close register color work, or where great strength is required, a metal or patent base is more satisfactory, but of course, it is more expensive.

Lead Moulded Electrotypes

These plates are mostly used for the higher grades of color work, as they are stronger and

more durable than ordinary electrotypes. Some engravers claim that the printing qualities of a lead moulded electrotype are quite equal to those of the original plate. Fine screen half-tones should always be duplicated by this method.

These plates are made by forcing sheet lead against the printing surface of the original plate so that the mould is made in this metal instead of in wax. This makes a sharp, clear negative impression. It requires, of course, heavy machinery capable of tremendous pressure, for from two to six hundred tons are applied according to the size and subject. The electro shell also requires a different process from that employed in the making of an ordinary electrotype.

It should be mentioned that lead-moulded electrotypes cannot be made from type matter for the reason that type metal will not stand the great pressure.

Steeltypes

Steeltypes are superior to electrotypes in wearing quality and sharpness, and in fact they are more desirable in every respect, especially for half-tones, where the screen must be preserved and the general feeling reproduced.

→ *Page Sixty-four* ←

They are not subject to the effects of colored inks as ordinary electrotypes are found to be and on this point alone they recommend themselves to the exacting advertiser. 500,000 impressions is the approximate run.

In making a steeltype, a deposit of steel is first made on the face of the mould, as the name implies.

Nickeltypes

Nickeltypes or nickel-plated electrotypes, for this is really what is meant by the term, are used for the express purpose of combating or preventing certain chemical actions that take place with some colored inks on the ordinary electrotypes. There are numerous inks that set up chemical action when they come in contact with copper, and the bad effect, which is unavoidable, is always blamed on the printer or paper man, whereas the correct plate should have been specified by the advertiser.

Nickel plating will naturally add to the wearing quality of a plate and for this reason nickeltypes are used where the run is extra long.

Stereotypes and the Matrix

Where fine reproduction is not requested or required we find the stereotype. Of course it

has its own purpose and its place in the field of advertising for when it comes to speed and low cost, this class of duplicating plate has many advantages. Its principal use is confined to distribution by manufacturers to their agents, jobbers and other representatives.

In most cases, however, it is the matrix that is sent out to these agents, not the metal plate.

Matrix. (In Latin, Womb). The word itself has something of a wide application, but it is chiefly used in the sense of a bed or enclosing mass in which something is shaped or formed. In the terms of reproduction it is used as meaning a mould of papier-maché in which a design or text matter is made in intaglio, and from which an impression is taken in relief.

In making the matrix, the papier-maché is beaten or rolled upon the original plate, type or whatever is to be duplicated, while it is soft and in a pulpy condition, until an impression is obtained. The plate is then heated until the matrix is actually baked dry. It is then removed and filled with molten stereotype metal, which when cooled and removed from the matrix mould, is a fair duplicate of the original plate. With careful handling, about fifteen stereotypes can be made from a good matrix,

but do not expect great things from this method. For type and line drawings which are not too fine, the stereotype will serve (remember all newspaper matter is stereotyped), but a 65-line half-tone is easily the limit of the best matrix. This of course is the finest half-tone that should be used for newspaper work.

Aluminum Types

These are used for certain kinds of color work where hardness and wearing qualities of the metal combined with great acid resisting qualities are essential.

Advertisers are required to send original half-tones to many of the best magazines and those of large circulation, not because they are used to print from, but in order that the magazine may make their own electrotypes. These originals are required in many cases so that the magazine may conform to their own standards of printing. Stippling and re-engraving is often necessary to put the plate in this printing condition.

Line engravings and half-tones that have been under-cut in the etching, will not make electrotypes either by the wax or lead-mould process, and moreover no good stereotype can be made from such originals.

Upon the quality of the original plate, depends the quality of any kind of electrotype, and the wearing quality of an electrotype depends on the same conditions governing the wearing quality of the original plate.

CHAPTER IX

What an Advertiser and Artist Should Know About Electrotypes

James R. Crowell

REILLY ELECTROTYPE CO., INC.
New York City

SOME time ago we had occasion to circularize all the leading users of electrotypes in New York City. This meant sending letters to about two thousand individuals and business concerns, and quite naturally the correspondence was heavy.

When the answers began to come in we were amazed to find that so many persons have the erroneous impression that an electrotype is identical with a photoengraving. The strange part of this is that the mistake is common even among those whose business requirements call for the frequent use of both electrotypes and photoengravings.

Even after these circular letters had been distributed we received orders for photoengravings. It seemed to be an appropriate time to familiarize these persons with the difference between the two articles, since it would be beneficial for everybody concerned—for the

users, for the photoengravers and for us. We therefore wrote many letters explaining what this difference is.

To those who make electrotypes and "think them," it is rather difficult to understand how any one could mistake an electrotype for a photoengraving. Nevertheless, it is apparent that many persons are under just such a misapprehension, and this fact has impelled us to preface this article with the question: "What is an electrotype?"

An electrotype is a reproduction of type composition, a half-tone cut or a line cut. There are three main groups—steel-faced lead moulds, steel-faced wax moulds and copper-faced wax moulds. The advantage of the lead mould over the wax and of the steel-faced wax moulds over the copper-faced wax moulds is explained in detail later.

As electrotypes were originally employed to facilitate printing and as printing is still the chief channel of their utility, we shall explain briefly what purpose they serve in this connection.

When printing was in the early stages of its development, production was slow and tedious. Printers would set the type, lock it in forms, attach it to the presses and then run off the

printed matter from the original type. This meant that the printed impressions could be obtained no more rapidly than it was possible for the type matter to strike the paper upon each operation of the press. And it must be remembered that there was just one impression of the same text at a time.

Subsequently printers evolved the idea of setting type in duplicate, so that a double impression could be obtained with a single operation of the press. This saved time and decreased the cost of press work, but greatly added to the cost of composition. The quest for more economical and swifter production resulted in the evolution of the electrotype.

To-day type forms, including those which contain illustrations, are sent to the electrotype foundry for as many reproductions as may be required. In "long run" printing, such as that involved in the publication of a magazine which has a circulation running into the hundreds of thousands, the present system is to have two, three or four electrotypes of the same text made, the number depending upon the capacity of the press. If two electrotypes are used, it is referred to in the trade as "running two up," if three are used, it is "three

up," etc. The more that are used the faster the production.

It will be seen from this that without electrotypes the publication of national magazines and the printing of books, pamphlets, catalogues, or similar material in large quantities would be virtually out of the question. Electrotypes are the same to such classes of printing as stereotypes are to the newspapers. You have undoubtedly seen the presses of a modern newspaper at work and observed the rapidity with which copies of the paper pour from the press. Perhaps you have observed further that the printing was done by means of curved plates which are adjusted on cylinders and come in contact with the paper as the cylinders revolved. Magazine printing is done in much the same way with the exception that the operation is not so rapid.

We have given this brief outline of the application of electrotypes to printing because there are some basic facts that must be understood before it is possible to grasp the technical points of plate-making. But as this article is addressed primarily to advertisers and artists, we shall go into greater detail regarding the relation of electrotypes to those professions. Undoubtedly quite a few of our readers already

have a comprehensive knowledge of the subject and to them it may appear that we are giving too much heed to the elementals of the industry. To them we can merely say that we have taken the premise that all our readers are entirely unfamiliar with the subject. We therefore ask the indulgence of those who have a partial or thorough knowledge of electrotyping.

It should be understood that when we refer to advertisers, we use the word in its broadest sense. By advertisers we mean individuals and corporations which handle their advertising directly, advertising agencies, commercial artists and advertising service companies. Many of these are such extensive buyers of the mechanical commodities used in advertising that they maintain special departments to supervise the ordering. The heads of these departments are known as production managers and they have or should have a thorough knowledge of printing and the allied trades. They know what to order and how to order and they form an indispensable liaison between the producer of copy and the producer of the manufactured article.

There are so many different kinds of electrotypes and so much chance to "go wrong"

in ordering them that it becomes extremely profitable for users to acquire all the information possible. It may save needless expense. It will certainly save time and it will also enable the purchaser to discuss his own needs intelligently and to place his order in a manner that will insure the best results and the promptest service.

In the electrotype trade, as in virtually every other business, the three dominating factors are quality, service and price. It would scarcely be possible to place them in their relative order of importance, for one is just as vital as the other, depending upon the needs of the buyer. Take service, for example. There are times when advertisers must have their work done in the utmost haste that they may catch certain issues of magazines or newspapers.

The value of service at such times supersedes the question of price. Quality is essential always. Price is a question that interests every wide-awake business man.

In the old pre-electrotype days when advertisers wished to conduct national campaigns, it was necessary for them to send printed proofs of their ads. to the various mediums with instructions to the composing rooms to

follow the style as nearly as possible. Illustrated national advertising was virtually out of the question in those days, for it would have been financially ruinous to the advertiser to furnish each newspaper with an original photoengraving cut. Neither was there any standardization to the advertisements, while the opportunity for errors was a stalking spectre that always rose up to stare the advertiser in the eyes.

Electrotypes have simplified national advertising just as they have made possible the printing of magazines, catalogues, etc., on a huge scale. To-day the advertiser has his copy set by a printer who specializes in that class of work. When it has been revised to the ultimate dotting of an "i," the type is "locked up for foundry" and sent to the electrotyper. "Locking up" means encasing the type and cuts, if there are any, securely in a chase, or metal frame, with type high metal guards adjusted close to the type or cuts. These guards are known as "bearers" and their usefulness is the protection of the sides of the type and cuts when the impression in wax is taken. They also serve as a protection in the subsequent processes.

We shall not attempt to describe the twenty-

six or more operations through which an electrotype passes in the making. To do so would involve the reader in a mass of technical matter, and it is doubtful whether he could gain a really comprehensive knowledge of the subject except through diligent study of a text book. A far better expedient for those who wish to know the various mechanical phases would be to spend an hour or two in a foundry and actually see the work done.

Regarding the extreme technical phases of the trade, it is sufficient to say that all electrotypes except lead moulds are made by moulding the original in wax. The wax impression is referred to as a case and it goes through various operations of cutting down and building up, of black leading for oxidizing, of oxidizing and of immersion in an electric bath. The latter process takes two hours or more and it is in the course of it that the copper or steel is deposited on the wax.

When the case is removed from the bath it contains a metal film, known as the shell. This film, which is the exact reproduction of the original, is then released from the case by means of hot water. Soldering fluid is poured on to the back of the shell and a sheet of tinfoil is laid over. It is then placed in a "backing

pan" and transferred to a metal pot, where it is left until the tinfoil melts. When the molten lead is poured over, the metal tin foil serves as an amalgamator and there is created for the shell a solid back of varying thickness depending upon the purpose which the plate is to serve. Usually the back is about 3/16 of an inch thick. Cooling off the cast, scrubbing, cleaning and sawing away the dead metal are the succeeding operations. The cast is then sent to the finishing room, where it goes through various other operations. No plate is permitted to leave the finishing room until it has been properly revised. Sometimes defects are found which cannot be obliterated by the finisher and the plate is then destroyed. In such instances it is entirely remade.

In filling an order for newspaper quantity electrotypes the first step is the manufacture of a pattern plate. The pattern is a master electrotype obtained in the usual manner of moulding the original form in wax. It is finished with the utmost care and in its completed form it is the exact prototype of the original. As many patterns are made as may be necessary to fill the advertiser's order expeditiously. If he should require, say, five hundred of the same subject in a great hurry, it

might be determined that ten patterns would be needed. That would mean one of two things—either the patterns would be arranged so that ten wax impressions would be obtained in each moulding or, should the plate be of such size that only two or three could be incorporated in the case, the patterns would be separated and worked on different moulding machines.

The rapidity with which newspaper electrotypes may be turned out depends entirely upon the mechanical equipment of the foundry and the skill of the workers. Of course it should be remembered that the allowance of a reasonable amount of time is not only a safeguard against errors, but also insures properly made plates. When so much thought and time and money are spent in the preparation of copy it is vital that the whole effect should not be spoiled by poor printing. We should not attempt to estimate the relation of good printing to the entire effectiveness of a compelling advertisement, but there is no denying that it is a highly important factor.

Advertisers will do well by bearing in mind one great fundamental truth about electrotypes. That there is nothing in the printing trade more shoddy than a shoddy electrotype.

Nothing is easier to obtain. The makers of shoddy electrotypes have tried to educate everybody to believe that all electrotypes are identical. *For them* such propaganda is "good business." For you, if *you believe it*, it is extremely bad business.

It is the advertiser's keen appreciation of the fact that clean, sharp printing enhances the value of his advertisement which causes him to give decided preference to electrotypes over stereotypes or mats. As this brings up one of the most acute questions which confront the advertiser in the selection of his mechanical paraphernalia, we shall give a precise explanation of the reasons why electrotypes are so superior to the other two. And as we are extensive producers of stereotypes and mats, we believe it will be realized that we are in an exceptional position to observe the different printing qualities and to pass judgment on their relative merits.

Since the usefulness of stereotypes and mats is limited almost exclusively to newspaper reproduction, it will be understood that the contrast between them and electrotypes is drawn only in respect to newspaper work. For the finer printing effects, such as catalogue and periodical work, stereotypes and mats are

entirely out of the question. A stereotype has neither the durability nor finish to permit its use in printing of the better class. In half-tone reproduction a 65 screen is about all that it will stand. But no matter how coarse the screen, it is never the same faithful reproduction that an electrotype is for the simple reason that it is mechanically impossible for it to be.

The difference between a mat and a stereotype is that a stereotype is just one step further toward the ultimate printing than is a mat. A mat is a reproduction of type composition or cut in the form of a mould made in specially prepared paper. A stereotype is a lead cast from the mat. Mats are sent only to newspaper offices which have casting apparatus. Stereotypes are sent to offices which are not thus equipped, but which use the stereotype itself as the printing plate. When mats are sent, the newspaper casts the stereotype from it and puts it in a form along with other type matter. The entire page is then moulded into one large mat and from this a curved stereotype is made. The latter is the final printing plate and is attached to the cylinders of the newspaper press.

It will be seen from this that the same com-

parison which can be drawn between electrotypes and stereotypes, can also be drawn between electrotypes and mats.

It is obvious that every time a reproduction gets further away from the original, it is bound to lose some of its sharpness. A stereotype or mat is just two processes further removed from the original than is the electrotype. Let us describe the course through which each passes and this will become perfectly plain. We will first follow the advertisement that reaches the printed newspaper by way of the mat. The six mechanical processes, given in their proper order of sequence, are as follows:

Original — electrotype — mat — stereotype —mat—stereotype.

If an electrotype is used, the mechanical processes would be four in number, as follows:

Original—electrotype—mat—stereotype.

Now we will follow the advertisement that goes to the newspaper which prints directly from flat-bed presses, usually the country weekly which cannot handle the mat because it has no facilities for casting. If a stereotype is used the processes are:

Original—electrotype—mat—stereotype.

If an electrotype is used the processes are:

Original—electrotype.

In making electrotypes, hundreds of tons of pressure are used to force the impression of the original into the wax or lead moulds. In making stereotypes there is no pressure used to obtain the impression, but the molten lead is allowed to settle over the surface of the mat on its own weight. Thus it will be seen that electrotypes are not only much sharper plates, but they are also two processes nearer to the original *and always the next thing to the original*, except of course, when the newspaper uses the original itself.

In deciding between electrotypes and stereotypes, the newspaper advertiser, therefore, has only one real question to consider. Electrotypes are a faithful reproduction of the original and vitalize the printing. Stereotypes are incapable of giving the same results, but they are cheaper.

To understand exactly when stereotypes or mats may be used as substitutes for electrotypes it is necessary to have had an intimate experience and to have visualized the difference in the printing qualities. That is the reason why advertising agencies maintain production departments headed by men who have specialized for years in ordering this material. They know precisely when it is the part of

wise economy to use stereotypes and mats in place of electrotypes.

In a general way production managers should observe the following rules when placing orders for newspaper material.

Order Electrotypes For

All advertisements containing half-tone.

All advertisements which are to be inserted in more than one issue of the newspaper.

All advertisements containing fine detail work which must be sharply printed.

All advertisements containing a large amount of open or white space.

All advertisements sent to newspapers which print directly from flat-bed presses and which have a run of more than 20,000.

Order Stereotypes For

"One insertion" advertisements which do not contain half-tone.

"One insertion" advertisements from plain type.

Order Mats For

Advertisements of the kind described in the stereotype group, but only when they are to be published by newspapers equipped with mechanical facilities for casting stereotypes

from mats. The majority of weekly and country papers are not thus equipped.

Do Not Order Stereotypes For

Advertisements containing half-tone.

Advertisements containing fine detail work which must be printed sharply.

Advertisements containing especially small-face type.

Advertisements containing a large amount of open or white space.

Advertisements to be published by newspapers which print directly from flat-bed presses and which have a run of more than 20,000.

Do Not Order Mats For

Advertisements to be published by newspapers which have no facilities for casting stereotypes.

Advertisements of the kind described in the stereotype "don't list."

The great majority of advertisers never use stereotypes or mats, but prefer to pay the additional cost of electrotypes for the reason that they are then certain of getting the best printing qualities. These buyers figure that the plate cost is after all such a small part of the

whole, it is better economy to obtain the best the market affords.

We shall now take up the three other kinds of electrotypes used by advertisers for purposes other than newspaper printing. These are steel-faced lead moulds, steel-faced wax moulds and copper-faced wax moulds. It is the latter variety of electrotype which is used for newspaper quantity work, but a different finish is required when a copper-faced plate is made for pamphlet, catalogue or magazine printing. Purchasers may easily guard against error by indicating on purchase order whether a "newspaper electrotype" or a "pattern plate" or a "printing plate" is wanted. These words have a definite meaning in an electrotype plant and furnish the key to the manner of manufacture. It is not only advisable, but extremely necessary that the description be written on the purchase order.

Lead moulds are an expression of the highest form of plate making. The original from which the impression is taken is either a copper photoengraving cut or a pattern electro on which there has been deposited a double veneer of steel to give it the necessary strength to withstand the great pressure of the moulding machine, 800 to 2,000 tons. It is inadvis-

able to employ zinc photoengraving cuts for making lead moulds. Aside from the fact that they do not possess the strength of copper and are likely to be crushed, it frequently happens that the dots are undercut, making it difficult or impossible to release the mould.

The impression is taken in a sheet of chemically pure lead and the reproduction thus obtained is the exact prototype of the original —such a precise copy of it, in fact, that the most expert eye cannot discern the difference.

It is impossible to make lead moulds from type, but not of type. When type reproductions are required it is done by making what is known as a combination plate. A wax mould of the type matter is first made and cut down to a point below the shoulder of the type. In the manufacture of the shell, a double thickness of steel is deposited and an especially hard metal is used in the backing up. This cast is then run down to a 16 gauge thickness, which is the same as the thickness of the original copper cut, with which it is made up into a pattern plate. The moulding in lead follows. The entire process is known in the trade as patching and making up.

As to when it is proper to order lead moulds, the following summary may be used as a guide.

Order Lead Moulds For

All reproductions of color plates.

All reproductions of cuts consisting of 133 screen or finer.

All magazine advertisements containing color work or half-tone.

All high-class catalog and pamphlet pages containing color work or half-tone.

We find it extremely difficult to suggest any set formula to assist advertisers in determining when to choose between steel and copper as a facing for electrotypes. It may simply be said that with all things equal, the life of steel is about two-thirds greater than that of copper, and from this point on it devolves upon the advertiser to use his own discretion. We shall, however, elucidate some points which should assist him in deciding.

When printing is to be done on any paper of hard fibre, such as bond, it is certainly essential that steel-faced plates be ordered. Indeed, when an especially heavy bond paper is to be used, the most practical course would be for the purchaser to get into communication with his electrotyper and acquaint him with that fact. In such circumstances a steel shell and metal back of great strength would be turned

out that the plate would survive the hard usage to which it would be subjected.

Careful make-ready of the printing press will prolong the life of any electrotype, whether it be steel or copper. If, for example, the rollers are low, there is bound to be a constant friction on the edges that will wear the plate down and eventually mar the printing.

A copper plate may survive only 30,000 impressions; again it may still be good after 175,000. A steel plate may collapse after 100,000 impressions; again it may be in excellent condition after 600,000. From which it will be seen there is no definite standard for determining their life. The texture of the paper, the quality of the electrotype itself and the usage which it receives in the printing office are the determining factors.

In conclusion we wish to emphasize two vital points. 1—Poor printing of your advertisement may spoil its entire effectiveness. Avoid patent "plates" which are put upon the market from time to time, only to vanish when confiding buyers have seen the light.

CHAPTER X

Rotogravure Process Printing

IT was only six years ago that the first advertisement ever printed by the rotogravure process in this country, appeared in a New York newspaper, and it was a very small one at that—about forty lines. How times have changed! It only needs a glance through one of our Sunday papers to see how extensively the rotogravure process is used by advertisers, both local and national.

The art possibilities of rotogravure reprotion seem to be the biggest phase of the subject as applied to advertising, but whatever has been done in the past, although a tribute to the enterprise, by no means indicates the extent of its future achievements and value.

That rotogravure will create a number of new and original uses for itself is evident and it seems to be generally admitted that it will take its place alongside printing and lithography for every purpose where these two processes are now employed.

If the word rotogravure were explained by its derivatives it would mean "roto," a roll, and "gravure," engraving, but this would not

adequately explain the process. Rotogravure is a process that necessitates an intaglio cylinder plate, a plate in which the printing surface is sunk below the surrounding portions, the lines or dots being pressed, cut or bitten into the surface holding the ink, which is to be impressed upon the paper. The old-fashioned steel engraving may be taken as the style of intaglio plate, in which the lines that printed were cut into the surface of the plate, instead of being left standing in relief; in other words, while the half-tone screen is mostly transparent, the rotogravure screen is mainly opaque.

We must credit what is known as the Rembrandt method as being the first to adopt this process of printing from engraved intaglio plates by a rotary machine. It was really an advance from photogravure, which was printing from a flat intaglio plate by a very slow hand process, yielding only about 700 prints from a plate. Now it is interesting to watch a modern machine pull about 3,500 impressions an hour.

Reproduction in one color seems to be represented at its present zenith by this process, for no commercial method of reproduction by mechanical means possesses the same power and quality and probably barring the Offset

Process, it is the nearest approach to a facsimile reproduction that has yet been arrived at. Contrasts, more brilliant high lights, deeper shades and depth are expressive characteristics. Some of the most widely advertised products are found among the adherents to this method of display. Yeast, underwear, veils, toothpaste, coffee, toilet articles, talking machines, stationery, cigarettes, chocolates, and ready-made houses, are only a few of the different advertisements to be found in the rotogravure section of any newspaper. This process actually opened up new fields of advertising expression, enabling the advertiser to reproduce numerous lines of merchandise heretofore neglected because of the inadequate possibilities of newsprint, either by line or by coarse half-tone. We have in mind, particularly, fabrics, garments, furs, undergarments, silks, etc. One of the most remarkable feats of the process is its ability to render reproductions of full color paintings in a way hitherto unequalled by any other printing method, due chiefly to the quality of the ink used and the tendency the method has of intensifying contrast.

So much for the good points of rotogravure, and there do not seem to be many bad ones,

but like every good thing, it can be overdone or misused. One thing to be guarded against is the fact that this process is purely a mode of expression for the artistic side of advertising. It is not as successful if used for reading matter or type display, and when the advertiser misuses the process in this respect the result is no improvement, in fact very often it is not as effective as the older methods. The copy or text should be as short and concise as possible and the type used should be of uniform body, and of plain, simple characters, avoiding reversed text and copy that wanders over part of the illustration.

It is always interesting to know who is directly responsible for methods and improvements in any line of endeavor. After much research it seems evident that more than one person is credited with the invention of the process for printing from intaglio plates.

The names of Rousillon, Goupil, Sir Joseph Swan and Karl Klietsch, all seem to bear evidence of their association in a more or less credited degree for introducing and perfecting the process. We think that Klietsch is generally given more of the credit, probably for the fact that he expended tremendous effort in making it a thoroughly practical process.

Klietsch was born in Bohemia in 1841, which was at that time a part of Austria-Hungary. We are told that he was the son of a chemist, but his ambition was the reproduction of pictures by printing. His early training as a chemist evidently helped him in his studies and to familiarize himself with the various branches of his profession, he studied photography and art.

In 1875 Klietsch is actually credited with perfecting the process of photogravure and a few years later in the city of Lancaster, England, he worked out the first practical details of rotogravure. This occurred about 1880, and the company that was organized to utilize the process for commercial purposes is still in existence in Lancaster. Some may ask if newspaper rotogravure sections started at that time, but as far as records show they did not. The company was engaged in printing artistic books and art subjects which gained wide attention, because of the wonderful results obtained.

It was not until 1911, thirty-one years later, that the first rotogravure work made its appearance in this country. This was probably due to several reasons, chief of which were the difficulties experienced in obtaining the proper

machinery, ink and paper, as well as the lack of trained workers. But rotogravure has come to stay and it has reached a high stage of development. Only the future will reveal the vast possibilities of the process. There is every sign that multi-color rotogravure will soon make its bow in public and when this happens, note some real competition between it and the more general photoengraving. After all, competition is what we want; it's another mother of invention or advancement.

Another interesting feature of any process is the cost. Rotogravure is not expensive if used on large runs of 75,000 or more, but for quantities of less than 50,000, the price will undoubtedly be high. So you see that the price depends chiefly on the length of the runs. Then, too, there might be considerable costly retouching on a page, or the advertiser may specify, unknowingly, technical difficulties which the printer is compelled to charge extra for. You will note that we say printer, not engraver, for it should be remembered that no such thing as a line cut, half-tone, electrotype, or mat enters into this process. When the drawing is O. K. the advertiser passes it on to the printer, who looks after the whole thing. He is both engraver and printer and,

like the lithographer, he has no composing room and no proof department, so do not look for proofs when your work is produced by this process.

And now how is it all done? Some like to know. The drawing, photograph or whatever kind of "copy" it may be, is first photographed and the negative retouched. From the negative is made a positive which in turn is again retouched if necessary. This is now printed on sensitized carbon paper upon which the screen is already printed. The carbon paper is then squeezed on a cylinder, which is afterwards etched with acid. The cylinder's outer surface is first coated with copper by electroplating it. Copper plating this cylinder is part of the engraving process and is done right in the same plant. The reproductions on the copper cylinder, if viewed through a magnifying lens, have depressions or cavities of varying depths, unlike half-tone plates, whose surfaces are made up of many small projections or dots. The screen used in this process, instead of reproducing light and heavy dots, makes cavities or depressions, some shallow and others deep. The varying depths of these cavities made it possible to obtain so many different tones by this process. The ink settles into the hollows

and when the plate is brought in contact with the paper, the ink is lifted out of the cavities and is carried away on the paper according to the amount of ink in the cavity. The deeper the cavity, the more intense are the shadows, because of the greater amount of ink carried away, and vice versa.

The printing is the simplest part, as there is no make-ready to bother with, as in the other more common forms of printing. The copper cylinders, for there are two of them, in order to print both sides of the paper at the same time, are now placed on the press just above a trough of special rotogravure ink, which is much more fluid than ordinary printing ink. As the cylinders revolve and emerge from the ink, a knife or "doctor," which works back and forth, scrapes the surface of the cylinder clean of ink, and leaves it only in the cavities. At a speed ranging from 3,000 to 3,500 impressions per hour (not so fast considering that some newspaper presses shoot out 150,000 copies per hour), the paper passes between the engraved cylinder and a heavy iron cylinder coated with rubber. The rubber-coated cylinder presses the paper into the cavities, and the ink is carried away as previously stated, the result being a rotogravure reproduction.

Rotogravure Printing. Courtesy Neo-Gravure Printing Co., Inc.

CHAPTER XI

How Rotogravure Pictures Are Made

NEO-GRAVURE PRINTING CO.
New York City

(Covered by book copyright)

SINCE nearly all the Sunday newspapers and many magazines throughout the country have either supplements or inserts printed by the rotogravure process, a description of how this is done will be of interest. It is the latest and most valuable application of photography to printing, so far as artistic results are concerned, and by it a web of paper can be printed from a copper cylinder at high speed.

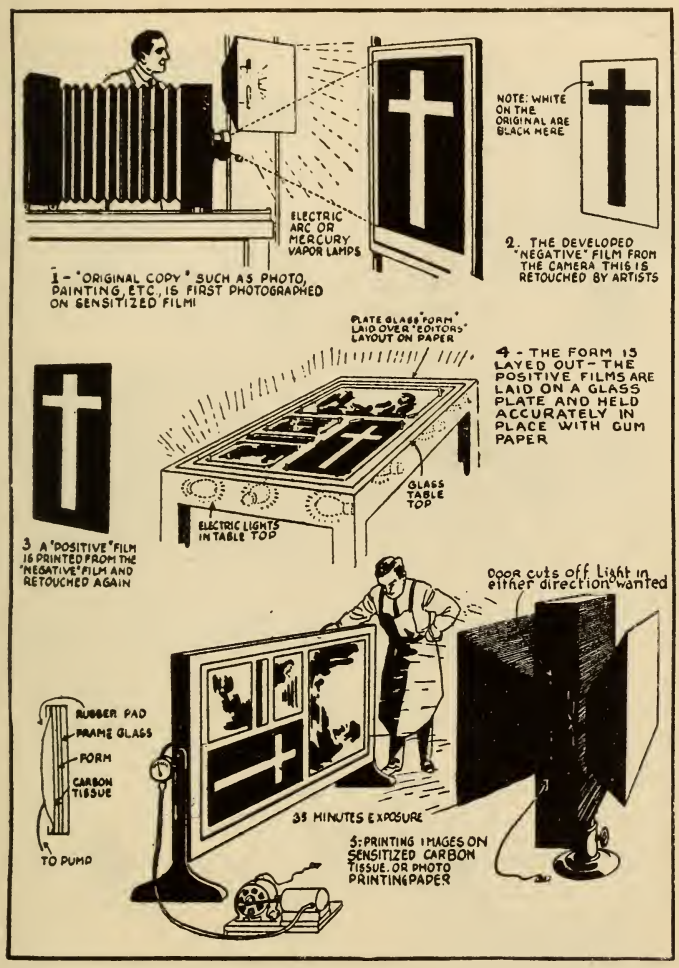
The following article will give, we hope, a description of the process in a simple manner.

"Photographing the Original Subject"

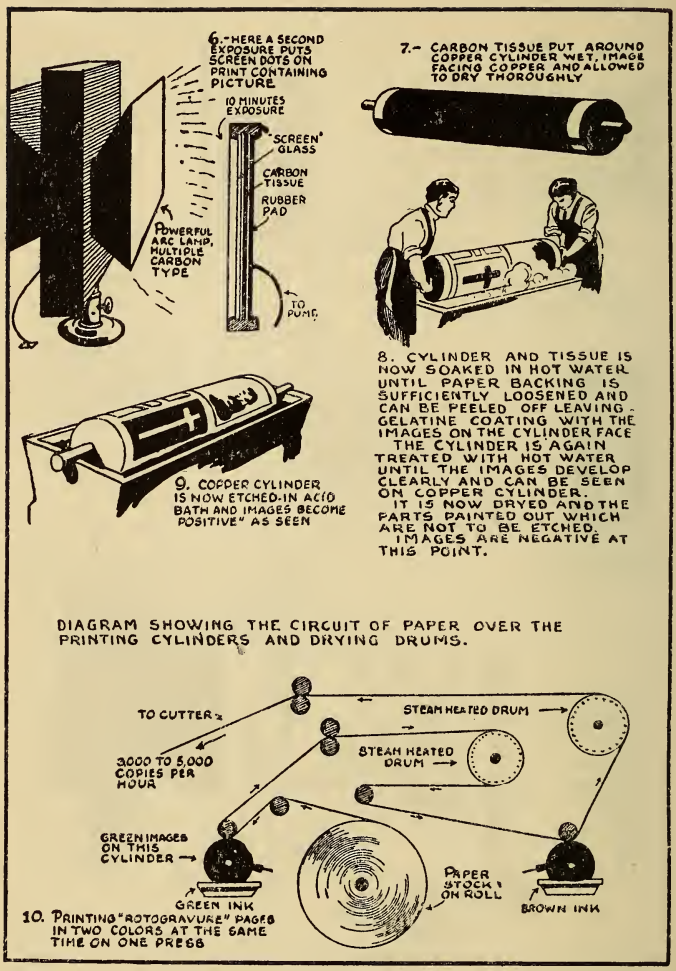
The first stage of the process is the making of the photographic negative from the original drawing of photograph. (Fig. 1.) This negative is made as clear as possible, because upon its success depends the quality of the positive made from it, and the success of the subsequent operations. Great care is taken in re-

touching the negative as well as the positive. (Fig. 2.) This consists not only in adding shades to the negative by working over the varnished or ground film with soft lead pencils, but in removing shades by scraping with a sharp knife on the positive.

One of the interesting developments of this rotogravure studio is a giant camera, probably one of the largest in the world. Upon seeing this camera you would not recognize it as such, unless its mysteries were explained. It is unlike the usual type of camera with which we are all familiar. There are no bellows at all, but, instead, a large room is substituted, which has been finished in a dead black paint. A huge plate and film holder slides along on a bed or table in the room so as to be readily focused. A hole about a foot square has been cut in the front wall of the room, and in this the lens is fitted. The panel covering this hole may be quickly released and different lenses inserted to suit the work in hand. Outside the room and directly in front of the lens there is a second bed or rack on which the copy carrier slides. This carrier consists of a large vertical frame or panel on which the art work (photograph, painting, etc.) can be secured. The giant camera is, of course, used only for large



Descriptive pictures of the Rotogravure Process, by the courtesy of *The Science and Invention Magazine*



Illustrating the successive stages followed in reproducing illustrations and text matter by the Rotogravure Process

layouts and art work of unusual size. The focal capacity of this camera is eight feet; and the largest plate or film which can be accommodated is 60 inches by 35 inches. For photographing the usual size of photos and other illustrations, the standard photoengravers' type of copying camera is employed.

"Making Up the Form"

By pasting the retouched positives on a large piece of plate glass, we enter the second stage of the process which is called "making up the form." A large piece of plate glass is placed on top of a ruled layout and each positive placed in its marked place on this glass.

The form is then ready to be taken into the carbon printing room, where it is placed in a vacuum printing frame.

In the meantime the carbon tissue paper, which comes in rolls 3 by 12 feet and which consists of a strong paper evenly coated with gelatin containing a brown pigment, is sensitized in bichromate of potash, squeegeed on a ferrotype plate and dried for not over two hours.

"Printing the Pictures on Carbon Tissue"

When ready to be used, the carbon tissue is cut into the proper size and placed on top of

the form in the vacuum printing frame. The vacuum printing frame is similar to that used by amateur photographers in printing their Kodak pictures, only it is much larger. The small-sized frame gives the necessary contact by a steel spring while the life-sized frames have a more elaborate mechanism. To be certain that all pictures which are placed in a large frame have good contact, a vacuum pump is connected by a flexible hose to a rubber blanket. An air pump then sucks the air from between the form and the blanket. In this way good contact is guaranteed between the picture form and carbon paper. Powerful arc lights are turned on and given a certain length of time exposure, which operation is also called printing. The carbon tissue with the printed pictures on it, is now put in another vacuum printing frame and placed on top of an engraved glass screen of from 150 to 175 lines to the inch and a second exposure is given. The tissue, which is really a paper, resembling "Solio" photo print stock, is now ready to be transferred to the copper cylinder.

The cylinders can be solid copper rolls, or better, hollow copper cylinders, slightly tapered on the inside so that they can be forced on a mandrel. Some are steel tubes on which

a shell of copper has been deposited by electroplating. These rolls are polished and turned absolutely true in a lathe before they reach the carbon transfer room.

"Transferring Picture to Copper Cylinder"

To transfer the printed carbon tissue to the copper cylinder, it is soaked in a solution of alcohol and water. When the tissue begins to flatten, it is quickly lifted out of the solution, adjusted to the position indicated by pencil marks which have been drawn on the cylinders, and squeegee securely to it. All the water possible is pressed out and all surplus moisture is wiped from the back with a soft cloth. The roll is allowed to set for at least twenty minutes while the trough is cleaned and prepared with hot water. When ready the cylinder is steadily turned over in the developing trough until the paper backing is loosened and finally stripped off. The soluble gelatin can now be washed away until the image shows proper development. The image will be found on the cylinder in gelatin relief, corresponding to the lights and shades of the positive, through which the light entered. Where the positive was densest the light penetrated least and the film of gelatin is consequently thin-

nest. Where the positive was most transparent, the light acted to the greatest extent and the carbon film is thickest. The tissue is then treated with alcohol and water, gradually increasing the alcohol until pure alcohol is used to drive out all the water possible from the film in order to accelerate and ensure its drying.

It is now ready to have the margins covered with asphalt varnish to prevent the acid from etching them, and when perfectly dry the cylinder is ready for etching.

Perchloride of iron of different strengths is the mordant used. The iron solution penetrates the thinnest parts of the gelatin resist first, and therefore etches the cylinder most under these parts. Where the gelatin resist is thickest, corresponding with the high lights of the positive, the mordant has the least effect on the copper and the etching is slightest. The important point to observe is that the screen lines are not etched away, for on the preservation of these lines as partitions between ink cavities and as bearers for the metal wiper, commonly called "doctor," the whole success of rotogravure printing depends.

After cleaning the asphalt protection from the roller with kerosene and removing the gelatin resist with a solution of acetic acid

and water, the cylinder is ready for the press.

The press which receives these copper cylinders is constructed in the usual method to allow the cylinder to revolve in a fountain filled with specially prepared ink. Since the design is etched below the surface, this ink fills the design. By scraping all superfluous ink off the outside of the copper cylinder with the aforementioned "doctor" blade, the surface of the cylinder is kept perfectly clean, and with the assistance of the rubber-covered roller or impression cylinder, the design from the copper cylinder is transferred to the web of paper when it passes between the rubber impression roller and the copper cylinder. As the inks are used in a very liquid state, it has been necessaryto introduce drying apparatus to dry the webs between printing on one side and the other, and also after printing on both sides, before passing to the further operation of folding and delivering the printed product in sheets.

The use of rotogravure printing is spreading rapidly. An increasing number of newspapers and magazines are adopting this type of printing for feature sections in their Sunday issues or as inserts in their magazines. The fact is that the wealth of detail and the distinct re-

production of features, especially in group pictures, make the new process a wonderful agent for the reproduction of scenes and photographs of current events and advertising in any form or size.

CHAPTER XII

The Ben Day Process and Its Application

WHEN anything new is invented in the field of labor-saving devices, there always seems to be a reaction, and poachers are many.

Benjamin Day and his successors, the Ben Day, Inc., on more than one occasion have been called upon to use legal means to protect the interests of that worthy organization and its patents pertaining to the Ben Day Process.

The Ben Day Process holds a prominent position in the "WHO'S WHO" of the engraving and allied professions. It is probably used more, and in proportion understood less than any other branch of reproduction. Benjamin Day believed in the saying: "Necessity is the mother of invention." Spending much valuable time in stippling and fussing with various effects, trying to get tone on his designs, he felt the call of invention, and invent he did, with so much success that now, even the youngest member of the advertising agency, is familiar with the trade-term significance of his name.

Following, expressed in the simplest terms, is an outline of the uses of the process. Being familiar with the term, and knowing that putting in a Ben Day tint means the treatment of certain parts of the design in different tones or effects, is not enough. There are automobile owners who probably know they have a magneto-equipped engine; they know when it functions and when it does not; but when it fails to function and they fail, through lack of proper knowledge, to correct the trouble, they promptly place the blame on the whole car. Thus is the engraver vituperated every day because of the lapses in foresight of the advertiser or artist. There are advertisers who do not understand that no screen is used in making a zinc plate; that a 133-line screen halftone is not suitable for newspaper work; and there are numerous agents who cannot judge the proper method of reproduction to suit their needs.

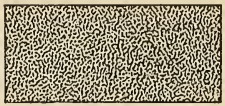
However, we are not writing a book to magnify the shortcomings of the advertising agent, but to try to show him how much there is to learn, and probably to teach a little too.

To "BEN DAY" a drawing is to use a modern mechanical method of lining or stippling it. Lining and stippling—representing the old-

No. 322.—6¾ x 11.

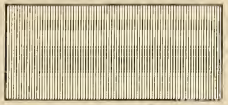
No. 1.—13 x 13.

No. 8.—13 x 13.

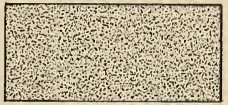


No. 310.—9 x 7½.

No. 325.—6¾ x 11.



No. 4.—9¾ x 9¾.

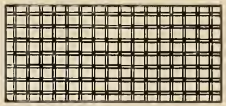


No. 301.—9¼ x 12¼.

No. 323.—6¾ x 11.

No. 329.—9¼ x 14¼

No. 333.—9¼ x 14¼.



No. 326.—6¾ x 11.

No. 332.—9¼ x 14¼.

No. 330.—9¼ x 14¼.

Courtesy of Ben Day, Inc.

est methods of producing tone and shading effects on plates for reproduction—are accepted as task-saving devices, and the artist, in particular, will concede this.

There are at the present time about 125 different patterns or effects to be obtained by the films supplied by the Ben Day Company, but an almost infinite number of other effects may be obtained by the clever *combination* of these films. It is the clever operation of the machine that makes it valuable. Some engraving houses make a specialty of Ben Day work and advertise to such an end, but the duration of their prestige depends upon the man who operates the instrument.

A Ben Day SCREEN, as some call it, is a transparent gelatine film, mounted upon a frame of wood. It has lines or dots or textures, as the case may be, in relief on one side, and when this side is rolled up, with ink and pressure applied on the reverse side, the pattern or tint effect of the film is transferred upon the drawing or plate. The actual process of application will be explained later. The shading film is held over the drawing or plate by means of registry appliances equipped with micrometric devices, so that the film tints may be increased in shade values at the discretion of

the operator. It is, however, far from being an ordinary tint-laying machine. An intelligent Ben Day operator can produce graded variations comparable with the old-time nuances of wood engraving.

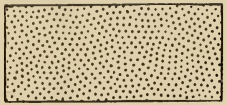
The tints supplied by the Ben Day Company are all practical and in demand every day for both magazine and newspaper work. There are straight-line tints, about twenty of them, ranging from sixteen lines to two hundred and forty to the inch. The use of such a screen as the latter is limited to fine paper work. Nothing over sixty-five lines should be used for newspaper work. There are also graduated and wave-line tints, used extensively for skies, backgrounds, rounded objects, etc., and a large complement of grains and textures, and hand and mechanical stipples.

All kinds of interesting effects are obtainable, some very fine leather textures, and others intended primarily for fashion work show shepherd's checks, and by ingenuity in combining screens, practically every material can be faithfully represented.

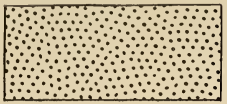
For the modern illustrator, Ben Day films play an important part in putting atmosphere and shadows in a drawing.

A screen sample book of the Ben Day Com-

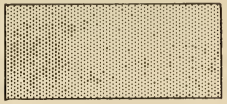
Specimens of Ben Day screens



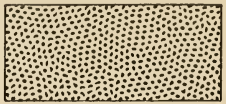
No. 432.—9¼ x 14¼



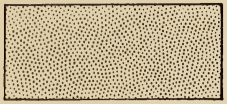
No. 419 B—9¼ x 14¼.



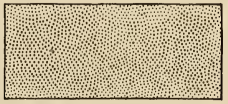
No. 509.—9¼ x 14¼.



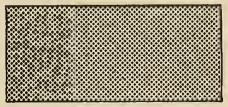
No. 426.—7 x 7.



No. 437.—9¼ x 14¼.

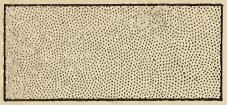


No. 433.—9¼ x 14¼.

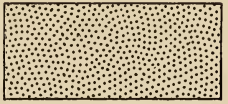


No. 505.—13 x 13.

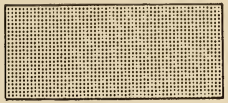
No. 434.—6¾ x 11.



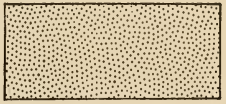
No. 440.—9¼ x 14¼.



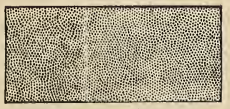
No. 438.—9¼ x 14¼.



No. 507.—13 x 13.



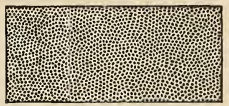
No. 439.—9¼ x 14¼.



No. 444.—6¾ x 11.

No. 441.—9¼ x 14¼.

No. 411.—8 x 5¼.



No. 443.—9¼ x 14¼.

pany should be in every studio and advertising agency. It contains samples representative of the screens made by this company, with the screens numbered, so that they can be selected and specified to the engraver. Artists, in particular, should study this book in order to familiarize themselves with the screens and the different effects and how they can be used in combination with each other. The writer has found that he can specify screens to be used in combination without any fear of producing bad "patterns." Experience teaches this.

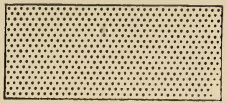
In selecting a screen, however, it must be continually kept in mind that what will be satisfactory in an engraver's proof is by no means a guarantee of what the finished work is going to look like. So much dissatisfaction is encountered along this line that too much stress cannot be laid upon it. Fast running presses produce a job far different looking from the patiently pulled proof of the engraver. Experience, as we have said, is the only teacher in the judicious selection of screens, but as a general rule, it should be understood that the more open the detail, the better the result for rotary press-work. The Ben Day screens, used direct on plate or negative work, are of course repro-

duced same size as shown in the proof-book. But when used on drawings intended for reduction, the artist must be well aware of the intended reductions of his drawings, and work with screens that will stand such reduction.

"BEN DAY" is also used extensively in the process of lithography. We do not wish to convey the idea that it is superior in artistic results or fineness of execution to the diamond point of the ruling machine, or the engraving needle; to fine stippling, or to the air brush; but for practical utility, clearness of detail and sureness of printing quality and technique, the Ben Day screen holds a prominent place in the lithographic field.

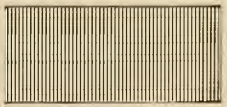
There are two kinds of apparatus in use for laying Ben Day. One, the Ben Day Holdfast Apparatus, elevates and protracts the screen over a lithographic stone. The other, the Ben Day Process Board Apparatus, is used for working on metal plates, negatives, or actual drawings in black and white. In either apparatus the frame of the Shading Film is provided with an adjustable bracket clamp which engages two micrometric pivotal hinges on a cross rod. When the screen is adjusted, it is found that it can thus be raised and lowered to observe the work as it progresses.

No. 318.—9¼ x 14¼.

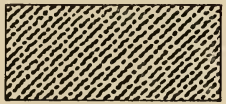


No. 523.—9¼ x 14¼

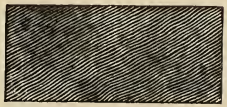
No. 3.—9¾ x 9¾.



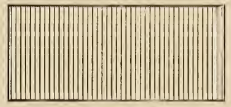
No. 2.—13 x 13.



No. 324.—6¾ x 11.



No. 602.—4¼ x 4½.



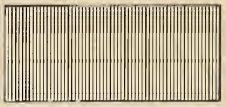
No. 7.—13 x 13.

No. 5.—13 x 13.

No. 327.—6¾ x 11.

No. 334.—9¼ x 14¼.

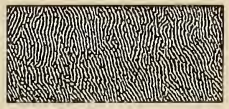
No. 10.—13 x 13.



No. 9.—13 x 13.

No. 331.—9¼ x 14¼.

No. 335.—9¼ x 14¼.



No. 309.—9 x 7¾.

No. 306.—5½ x 6½.

Courtesy of Ben Day, Inc.

In laying a screen on a lithographic stone, the film is first placed over an inking pad and the face of the film, so supported, is inked with an especially good grade of transfer ink; some prefer a quick-drying ink. This inking is done with the usual hand roller.

The stone is first "stopped out" carefully; that is to say, a gum solution is painted over such parts of the stone as are not to be treated with the Ben Day effect. The stopping-out process is exactly the same as required in any piece of work that must be masked to protect it—just as the retoucher stops out certain parts of the picture by using frisket paper. The screen is now placed in the machine and adjusted over the stone. The outline drawing can easily be seen through the gelatine film, and it is not a difficult matter to press the film down on the stone and transfer the inked pattern to it on those parts which are to receive the effect. This is done by applying pressure to the back of the film by means of an agate stylus or a rubber roller, whichever may be found the more practicable tool for the job in hand.

In laying Ben Day tints on metal plate work, the "stopping out" is effected by painting the parts of the plate not to be treated, with gam-

boge. Then the screen is inked and laid as usual and when completed, the etching of the plates is carried on from this point without variation from the methods described in the making of zinc plates in another chapter.

Negative effects are obtained by laying the screen on the negative previous to stripping it. By this method we have the reverse effect when the plate is complete. For instance, if the screen used consists of straight black lines, we have, when the proof is pulled, a solid background with white lines superimposed. Any other effect is naturally treated in the same way.

"Ben Day" will have even a wider use as time passes. Advertisers will some day grow tired of trying to print half-tones on uncoated stock, and turn to Ben Day, as a tired child turns to its mother. (Don't laugh, we mean you!) How many advertisers are familiar with the wonderful results obtained in the printing of children's books with 2, 3 and 4 Ben Day plates? On uncoated stock, too! What's that? Sure! Let's buy a baby's book and learn sumpton!

CHAPTER XIII

Ben Day Screens—A Logical Process

by

THE WALKER ENGRAVING CO.
New York City

WE have been shown in previous chapters that engravings are made by printing photographically on metal with a substance which becomes acid resistent. This substance protects the plate from the etching acid, while all parts not so protected etch down and form a relief printing plate.

There are other ways of applying acid-resisting substances to plates which are to be etched and the Ben Day process is one in general use. The process derives its name from Benjamin Day, who invented and developed the method. Its purpose is to supply lines, dots or other patterns and designs, which do not appear in the original copy. Films made of a semi-transparent material are furnished by the Ben Day Co. On the surface of each film is a design which corresponds to the printed samples supplied in the book of Ben Day tints. These designs may be in any one of a great number of textures, but for the purpose of

explaining the process, let us select four different films and consider that we are to Ben Day the picture shown in Figure 1. To apply these various tints to the plate, it is only necessary to roll the films with ink and print them on the metal plate by pressure. The ink thus printed on the metal is sticky. After each application of a film the plate is dusted with a resinous powder, which, when heated, melts and will resist acid. When the plate is etched, the dots and effects which were printed from the Ben Day films are in relief and will print the paper.

This is a general outline of the method, but the details of the process are quite intricate and are worthy of careful study if one contemplates using the Ben Day method extensively. There are more than a hundred different textures of films and the selection of the tint to be used depends not only upon the effect desired, but the paper on which the plate is to be printed. When etched, these are, after all, relief plates and for this reason a very fine tint will print no better on poor paper than would a fine screen half-tone. The method by which one would determine the fineness of screen for half-tones, would apply in exactly the same manner to Ben Day plates. The rougher the paper, the coarser the texture of the tint. Too

Figure "A"
Showing the working drawing as supplied to the engraver. An overlay of tissue paper designated the screens to be used and their position

much emphasis cannot be laid on this matter, as many inexperienced users of the Ben Day method seem to believe that it is a cure for all photoengraving ills and that if a job cannot be made to print in any other way, the Ben Day process will fix it up all right.

Ben Day Tints and Their Addition to a Design

The illustration in Figure 1 shows a design in line work to which Ben Day tints are to be added. The design is first photographed and printed photographically on the metal just as though it were to be etched as a line plate. Before etching, however, the Ben Day tints must be laid. Obviously, it would be difficult to print the different tints on just the areas desired, without running over on some other part of the plate, so the plate is treated to what is called "gumming out." The areas which are not to be treated are painted over with a water color solution called gamboge. The solution is soluble in water and is very carefully applied, so that it will just touch the outlines of the work where the Ben Day tint is to begin. Of course, this leaves bare metal where the tint is to be laid.

The film to be used is then carefully inked with special Ben Day ink, using a hard roller,

much after the fashion of inking a printing plate. The film is laid on the metal plate and rubbed from the back. This transfers, or prints on the metal, whatever pattern appears on the film. After the tint has been laid, the metal plate is gently washed in water. The ink, which is of a greasy nature, resists the water and does not wash away, but the gamboge, which is soluble, washes away and takes with it any ink which has been printed on the gamboged parts. The plate is then dryed and dusted with resinous powder (this operation being known as "topping up"). The plate is next heated, which causes the design printed thereon to resist acid. Any other Ben Day screens are laid in the same manner. Figure 2 shows the finished plate.

It is very often desired to stipple certain parts of a design which are solid black, so as to allow their printing in certain magazines which do not allow heavy solid black areas. In such cases, by following out the stages of the process, it will be seen that were the design printed photographically on the metal, those black areas would also be black on the metal, that is, already protected with an acid resist, leaving no metal on which to lay the tint. There are two methods of overcoming this:

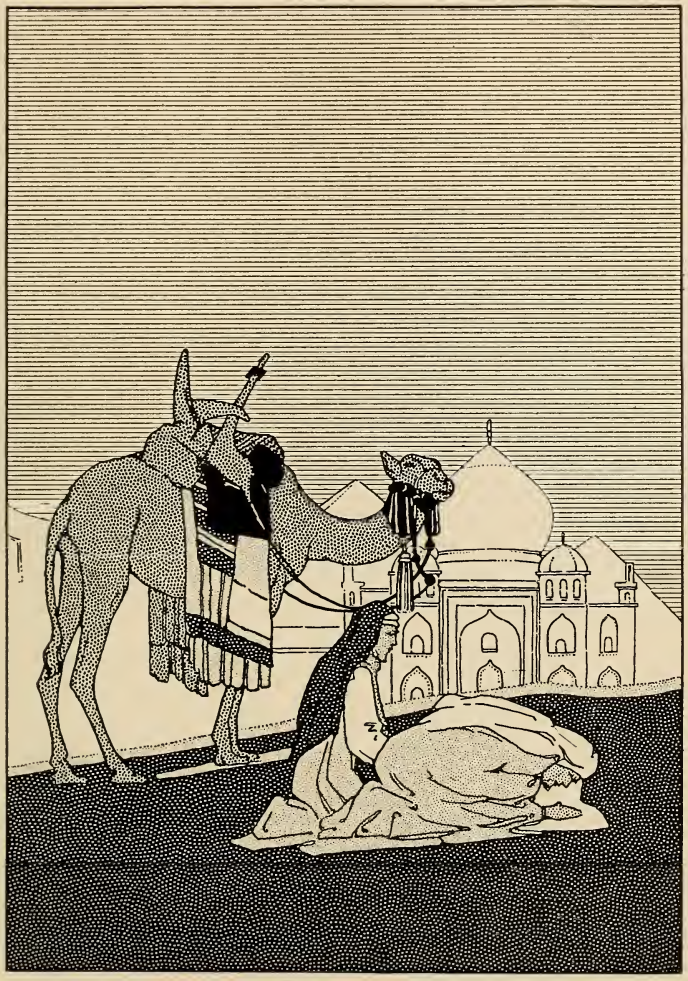


Figure "B"
The finished plate. Screens used are: Sky (7), Camel (443), Robes (440), Ground (441)

First, consider what the negative of the subject would look like. All values of the negative are the reverse of the original copy. Black is white (transparent) and whites are black. It is quite possible to "gum out" on the negative, leaving the area to be tinted ungummed. A tint is then laid on the negative, but the tint must be the reverse of the tint wanted on the finished plate. Suppose, for instance, that screen No. 433 has been specified as the stipple desired. It so happens that there is a tint No. 441, which is practically the opposite to No. 433, having a black area with white dots. (See the screen specimens.) By laying this tint on the negative, the desired result is obtained. This is one way out of the difficulty, but it is not always possible to follow this procedure, because there are not always opposite tints to the ones desired.

The second method is to make the metal print, black area and all. Parts of the print would then be gummed over, leaving exposed only the black area to be tinted. The metal print is next inked with a greasy ink and gently washed in benzine. This will dissolve and wash away the black area exposed by the gum, but the gum, which is insoluble in benzine, will not be washed away. The regular No. 433 tint would then be laid in the usual manner on the

area to be tinted. After the usual washing the black area is converted into dots of the No. 433 tint. Of course the best way is to make the original copy with a white area where the Ben Day is to be laid. The tint can then be laid without difficulty and considerable expense will be avoided.

When planning to add a Ben Day tint to any plate, it will aid in understanding what has to be done, if one will consider that the tint must be added, just as though it were to be put on the original drawing in black lines or dots.

In considering any method wherein the print on the metal is to be dissolved with benzine or turpentine, it is well to understand that this applies only to such prints as are made with this greasy ink. Most zinc plates are printed with this so-called "ink top."

Copper plates are printed with an "enamel top" which is baked on. This is not soluble, so that Ben Day tints on copper plates can only be laid where the design permits, unless the tint is laid on the negative, in which case the print may be subsequently made on either copper or zinc.

Ben Day Tints on Stained Plates

In the case of using a second color, which,

of course, necessitates a second plate, let us assume the design to be the same as that shown in Figure 1 and that color is to be added as a second printing in red or pink.

The first plate is made as shown in Figure 2, except probably the screen which is shown in the faces. This could be left out and a tint of red substituted from the second plate.

Red tints of varying strengths could be added to the robes of the men and solid red could be judiciously spotted about the saddle and equipment of the camel.

Having these instructions, an extra metal print is made from the same negative. This print is then placed in the acid for just a moment, and the acid, while not having any time to etch the plate to any depth, attacks the metal sufficiently to leave its mark very distinctly. The print is then cleaned off, but the image remains on the metal as a "stain." This is necessary in order to have a guide for laying the tints. This stained print is then gummed out, following the lines of the stain and the Ben Day tints laid as required. All parts which are to be solid are painted in solid on the plate with an acid resist known as "asphaltum." When etched the plate is ready to print only where the color is wanted.

Had the original print been allowed to remain on the metal, all the design would have printed in the red plate as well as in the black, which would have destroyed the effectiveness of the design. Stained plates can only be made on zinc. This method is the basis of all Ben Day color plates and is not limited to simple line designs.

Now let us consider that the original subject is a photograph and that it is to be made into a set of four color plates. A half-tone is made and finished up as a key plate, which usually prints in black. From the half-tone negative three zinc stains are then made, one for each color to be used. The necessary tints are laid on each plate and all four plates are printed in their required colors, one being superimposed on the other.

Great care and skill must necessarily be employed in laying the tints on a set of plates of this nature, as hand painting the colors by means of these Ben Day tints and their combinations is really necessary.

Understanding the Principle of the Ben Day Film

It will be recalled that each dot or line on a Ben Day film is of a uniform size. For instance,

if Ben Day No. 509 is selected as a tint, this film will simply print light dots with no gradations.

Assuming that a tone is wanted which is darker than the tint of the film, it becomes necessary to lay this film more than once on the same plate. This is accomplished by shifting the film over the work ever so slightly, so that each dot will double up and print heavier. On a rod at the upper edge of the machine is carried a set of micrometer adjusting screws. These micrometers are so arranged that the film may be fastened accurately to them, but in such a manner that it may be removed and replaced in exact position. The film is set in position, then removed and inked and the first impression laid on the plate. The micrometers are then adjusted to move the film, say, just half the width of one of the dots. The film is again removed, inked and laid over the plate once more. As the film has been moved the necessary width, the second impression on the metal increases the size of the dot just fifty per cent., giving a tint correspondingly darker. This is what is known as "doubling up" and may be repeated until the desired tone or strength is secured.

Graded or blended tones may be obtained

in the same manner, but great skill must be employed, as the pressure in rubbing the film on the plate regulates to a large extent the degree of tone and strength. Highly skilled operators or Ben Day men, as they are called, can obtain remarkable results in this manner.

Different Ben Day films may also be combined, which will give unusual effects, imitating anything from cloth to leather.

Sizes of Ben Day Plates

The size of an area to be tinted is sometimes larger than the Ben Day film selected. In this case it becomes necessary to again use the micrometer adjusters. The film is laid over a portion of the plate and then shifted to the remainder of the area and relaid. It will be appreciated what great care must be exercised in order to carry out these operations, when one considers that every dot or line of the first impression must match up absolutely with every corresponding dot or line of the second impression. This operation is particularly delicate and difficult when single-line films, like No. 10, or even more complicated ones have to be doubled up to give heavier lines than shown in the film sample book.

CHAPTER XIV

A Look into Lithography

THE first processes of Lithography were discovered by Alois Senefelder of Munich, in 1796, but while the invention is rightfully ascribed to him, it is also agreed that Simon Schmidt, of Germany, and William Blake, of England, used a somewhat similar process of reproducing writings and "art" nearly twenty years previous. It was in the quarries at Solenhofen, Bavaria, Germany, that Senefelder located a closely grained limestone, which was so sensitive that it would absorb either grease or water, and later discovered that water would not penetrate any part of the stone that was covered with the grease. In experiments following the discovery, Senefelder drew letters and designs with greasy crayons on the stone and then dampened the entire surface with water. He then applied printers' ink to the stone and found that the ink only adhered to such parts as were covered by the crayon, the wet parts of the stone repelling the ink.

By this method Senefelder was only able to get a reversed impression of his design, as you

get on a blotter. However, it was soon learned that if the design were reversed on the stone, the impression was then readable or "positive."

Not all stones used nowadays will absorb ink like a blotter, nor reject it when the stone is wet. Practically the only stones ever discovered with these peculiar tendencies were those from the quarries which first gave Senefelder the idea of reproduction from stone, and these fine limestones from Solenhofen are now exported to all parts of the world. The stones are sawn at the quarries into slabs 3 to 4 inches thick and from 6-8 inches to 44-62 inches in area. They vary in color from a light cream, full yellow, drab or gray, to darker shades of the same colors, the lighter tints being softer stones than the darker.

For many years after its discovery the actual printing was done by hand. Even to-day the hand press is still used for proving and some lithographers will tell you that they use it occasionally for short runs. Mechanical ingenuity has now invented fast running presses which will print many thousands of impressions in a day. The most modern of these presses is known as the Offset Press. The process used is different from the stone press, inasmuch as the image is engraved on a metal

plate from which it is transferred, in the operation of printing, to a rubber blanket and thence to the paper. This is more fully described in another chapter.

There are two separate and distinct methods of reproduction from stone, but perhaps a lithographer will tell you that there are about twenty-two. However, they only constitute branches of the two most vital differences of reproduction that we have in mind. One of these methods is used only for what a photo-engraver would call "straight black and white," and the design is put on a smooth-surfaced, highly polished stone. Any work that requires only pen and ink to make the design is termed "black and white" and may be reproduced by this method. It is also possible to use a Ben Day machine to obtain shading or tone effects. A reference to the older lithographed letterheads will illustrate this method, although the shading, which in some instances will be found to be very elaborate, was done by hand before the shading machine was invented.

The second method, which is the more artistic from a standpoint of modern requirements, is what is sometimes called crayon work. By this means the expert lithographic artist is enabled to reproduce the most dif-

ficult subjects with ease, provided he is allowed the correct number of stones or colors. Here, we might say, is where the many controversies occur between the advertiser and the lithographers, as to the number of colors to use for a particular subject. It should be understood by the advertiser that a separate stone and separate printing will be necessary for each distinct solid color used by the artist. Here are two instances most common. When an artist uses a straight or pure shade of Pogany blue for a sky, it cannot be reproduced by a crayon of ultramarine used in some other part of the design. It is a distinct color. Just the same with grays. A fine French gray might be used, but a light crayoning on the black plate will not obtain a correct French gray, so a separate stone is necessary. In all cases where color drawings are made for reproduction by lithography, the number of colors should be distinctly understood by the artist, and, moreover, the artist should understand how to use them, if satisfactory results are to be obtained. The artist should bear in mind that the lithographer does not use white to thin or tone down a color, and any color that is materially affected by the addition of white will, in many cases, be different when obtained

by stippling or crayoning on stone. For example, make a light color from any solid or pure color. Then put the same pure or solid color in an air-brush and spray on a light tone about the same as obtained with white in the first test. Notice the difference and you will know the limit to which lithographers must work, compared to the artist. This also applies to the reproduction of color by any process. We might mention, for the benefit of those who are interested in the actual processes of lithography, that the stones used in this method are, instead of being polished, broken up into minute points, known technically as a "grain." The lighographic chalk is then received on the stone in proportion to the pressure employed.

CHAPTER XV

What an Advertiser and Artist Should Know About Lithography

An essay by

Joseph Ellner

Of EINSON LITHO, INC.

New York

LITHOGRAPHY is a method of printing direct from the surface of stone, zinc, aluminum, tin or other metal. It is different from all other methods of printing and has properly been called chemical printing.

Joseph Pennell, in his valuable book, "Lithography and Lithographers," tersely sums up the theory and practice of lithography: "If the stone is drawn upon, or has transferred to it a design in greasy ink or chalk, and this design is washed with water, the grease of the design will repel the water and those parts of the stone or plate which are blank will absorb it. If now a roller, charged with the same greasy ink, is passed over the flat surface of the stone, the ink will come off the roller and adhere to the greasy design. But the blank parts of the stone which are wet

will refuse to take the ink from the roller and will remain blank."

Like all other arts, lithography has a technique of its own which the artist in past days had to master to have his work reproduced by the lithographic process. Few artists today, however, have a working knowledge of lithographic processes and their limitations, while those who have are rewarded by superior results in the reproduction of their work.

One of the fundamental points the artist must ascertain before he sets brush to paper is how his drawing will be reproduced. Will it be by "straight" lithography, or by "photo-litho"? If "straight," then he is severely limited as to color range. He should determine whether four or six colors will be allowed him. He should further confine himself to flat colors as far as possible and scrupulously avoid tints.

If his drawing is to be reproduced by the "photo-litho" process, the artist enjoys a wider range of colors, shades and tints, with the added confidence that the impartial camera will reproduce everything that is in his drawing.

There are two distinct methods of preparing drawings for reproduction by the lithographic process: The first consists of the work of the

artist, done on paper in the regular or "positive" way, then reproduced on an engraving stone by the engraver, who engraves or scratches the design or lettering into the smooth surface of the stone in reverse or "negative" for the stone press or the direct printing rotary press. For the rubber blanket offset press the engravings are made direct or positive.

Right here is where the woeful discrepancies often occur between the original design and the reproduction. To copy the original design onto the stone or plate requires a high degree of artistic skill, and unless this is done by a well-trained man patiently and carefully, the resulting work will lack the very qualities which made the original an acceptable drawing.

When the engraving is finished, the transferrer pulls a transfer impression from it, which is laid on the printing stone or plate, ready for the pressman to put on the press and run off the edition.

Another method, used almost universally by all poster and color lithographers, consists in having the design to be reproduced made directly on the printing stone or plate by means of crayons or pencils. This method requires no transfer to get ready for the press,

but the design must naturally be drawn in reverse.

The other, in which paper or a very thin zinc plate, provided with a light sensitive film, is exposed under an ordinary—that is, reversed—negative, thus is capable of receiving fatty inks and is then transferred to the plate by transfers.

Each color is thus photographed on a separate plate, and it is in the making and handling of these color separation negatives that the science of photo-lithography reverts back again to the realm of a highly specialized art.

Photo-lithography is the method of producing from plates copies of a design transferred to them by the regular photographic process. The use of the camera has given lithography a practically unlimited range, and the possibilities have by no means been exhausted yet. The lithographer is today able to take an oil painting, and with a special machine and in an incredibly short time separate the colors, reduce or enlarge the size, and put them on plates ready for the offset press.

The photo-lithographic process may be divided into two main classes: The first, in which the plate is coated with the light sensitive photographic substance and exposed

under a reversed negative, so that a reversed image is formed on the plate which, in printing, comes in the right position.

Offset lithography is printing from a metal plate to a rubber blanket and thence to the surface of the paper. The basis of offset printing is the substitution of metal plates for lithographic stone. The offset press consists of three cylinders: one to carry the printing plate, another to carry the rubber blanket, and a third to carry the sheet and effect the impression from the rubber blanket to the paper.

The offset press, a comparative innovation, has advanced so rapidly during the past few years that it now, to all intents and purposes, covers the entire field of lithography.

Among the many distinct advantages of offset lithography over the older method is the power to secure a more solid and sharp impression with a smaller volume of ink, thus preserving the work on the plate for longer runs.

The subject of lithograph inks is of vital concern to the artist. What inks are at the disposal of the lithographer for the reproduction of the artist's carefully selected and highly refined pigments or water colors? Theoretically any painting or water-color sketch in any num-

ber of colors can be reproduced with remarkable fidelity by lithography. Practically, however, severe limits are set up for the lithographer, which determine the accuracy of the reproduction. The two most important limitations are: one, the economic, the number of colors permitted by the customer who pays for the work; two, the technical, the range of colors at the service of the lithographer.

In general lithographic colored inks may be divided into three classes:

Opaque—Dense, great covering powers—Black, vermilion, white, lemon yellow, orange yellow, chrome yellow.

Semi-transparent—Medium density, medium covering power—Cardinal red, scarlet red, bronze blue, milori blue, medium green, purple, umber, sienna.

Transparent—Weak in coloring—Carmine, yellow lake, orange lake, madder lake, krapp lake, green lake, blue lake.

In addition to the above the following special colors are often employed for certain kinds of work:

Opaque—Concentrated blue, ultramarine blue, French blue, photo brown, flake white, silver white, gloss white.

Semi-transparent—Process yellow, bronze

red, Jacqueminot lake, Antwerp blue, Bismarck brown, royal purple, permanent purple, Chemnitz white.

Transparent—Indian yellow, rose lake, emerald green, Victoria green, silk green.

Apparently this list of colors should give the lithographer a color range that is almost limitless. But practically this is not so, save for the highest class of art lithography. Most commercial lithographers work in a uniform color scale, which is accounted a distinct economy in combination sheet work. This is a systematic regulation of the number of colors to use, which in various combinations permits the running of a group of different drawings on a common sheet. This, of course, means economy in production costs, but unfortunately it too frequently is at the expense of the artist's most cherished color scheme. On the other hand, it must in justice be said that very often a drawing finding its way to such a common sheet gets an extra color or two that it would not receive if it were run separately, and vastly improving the original thereby.

The whole problem of color emphasizes the importance of artist and lithographer working together in close agreement of their art and technique. Wherever possible the artist should

be in consultation with the lithographer who is to reproduce his work.

Lithography as practised today has not yet reached the limit of its possibilities. Every year, one might say every month, sees new ideas, new devices, new processes introduced, all tending to make it a more perfect medium of reproduction. The artist who is jealous of his work and takes pride in its proper reproduction should inform himself about this youngest and probably most highly developed of all the reproductive arts.

CHAPTER XVI

A Talk About Offset

THE Offset Process of Lithography is not as widely known and understood among advertisers and artists as it should be, and for this it has not received all the credit due it.

When the first Offset Press was introduced, there were many scoffers and those who would not believe in the practicability of a process that required the work to be first transferred to a metal plate, and then printed on a rubber plate and finally transferred from this to the paper.

The preparation of drawings for this process does not require any special mention. Anything from a simple line to the most difficult color drawing can be easily and faithfully reproduced on an Offset Press, so for that reason we shall confine this chapter to a review of the process and its advantages.

Offset was first intended for black and white reproduction, but it gradually worked its way into the color field, and it made good from the start. Every day some one is discovering something new about the process, with the result that remarkable work is being produced, which

demonstrates beyond the shadow of a doubt that in the field of fine color work, Offset printing will be the demand of the future.

Advertisers frequently use coated paper for printing because they cannot obtain the desired results on other kinds of stock. However, it is not necessary to use coated paper to get the correct effect on an Offset Press. It will print a half-tone on rough paper and print it perfectly.

The half-tone dot has a pure solid impression when printed by this method. The typographic process forces the raised point of the half-tone partially into the glazed paper surface, and the center of the dot becomes denuded of its ink, which has been squeezed out to the outer edge. This danger is eliminated by the Offset Process, and the most perfect half-tone printing is obtainable, especially if a high light or sensitive process plate is used.

Such uneven surfaces as imitation leather and embossed papers are no obstacles for the Offset Press. These can be printed upon without destroying the surface markings, which is an accomplishment not obtainable by any other printing process.

The rubber impresses the ink on the paper more delicately and there is less pressure, less

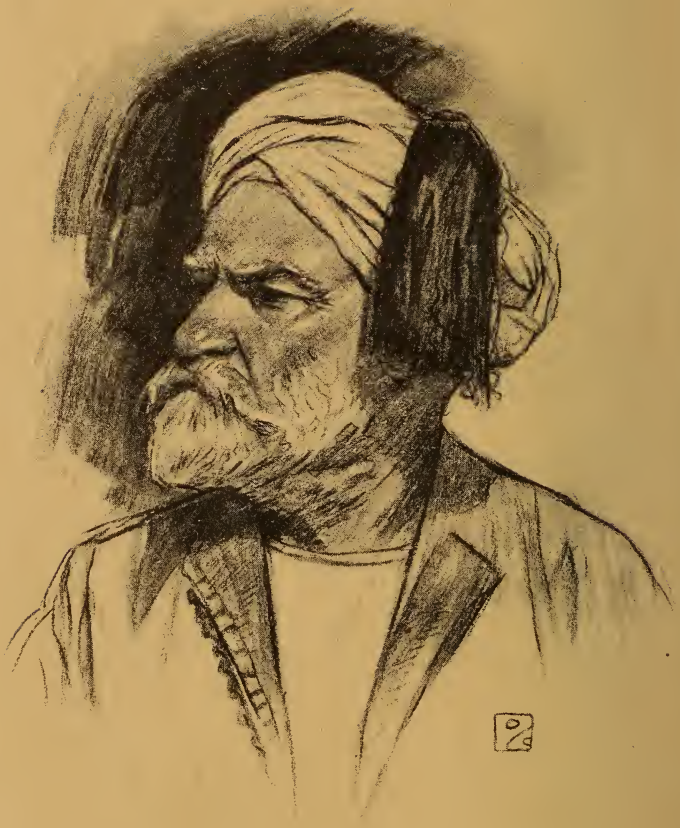
stretching, less creasing and less overlapping of the paper, as well as less risk of bad register. The rubber blanket was formerly confined to printing on tin and its introduction in commercial lithography dates but a few years back. Because of the elasticity of the blanket, it was found that a perfect impression, which brought up every line of the engraving, could be obtained, no matter how fine the detail or how fast the press ran. Still further improvements were made, and to-day we have the rubber Offset Press capable of doing multi-colored work with startling rapidity and effectiveness. Among other developments is a set of machines which, when used in connection with the camera, enable the lithographer to take the most difficult color subject in oil painting, for instance, and in an incredibly short space of time, separate the colors, reduce or enlarge the size, and have plates ready for the Offset Press.

It is here, we believe, that a tribute might be paid to photography, the ally of practically all processes of reproduction. Photography was not discovered by any one person, but was the contribution of many minds. Through the revelation of Mungo Ponton, in 1839, chromic acid was found to be sensitive to light. Talbot

disclosed the fact that chromic gelatine became insoluble in water, and by the adoption of this principle by Poiteoin, a new field of endeavor was opened to the art of reproduction. The screen process was its highest realization, and the unexcelled principle of litho-transfer, the extreme fineness of the Ben Day film, the introduction of metal plates, self-feeding machinery, the rubber blanket off-set, rapid printing presses, in short, the host of mechanical and chemical devices opened to graphic endeavor form a constantly growing tribute to the photographic art.

Photography, it can be truly said, is mistress of all processes. It is the method par excellence which has made possible the combined mechano-chemical processes which have found their fullest, most far-reaching and economical exemplification of the most creditable versatile methods of reproduction as practised to-day.

Through the advent of photography an immense flood of light has been shed upon the reproduction and development of art and the invitation to reproduce the marvelous color displays of nature by means of the camera is the seeming goal of the engravers.



Example of Charcoal Drawing, original sketch reproduced by the courtesy of the Pancoast Studios. High-light half-tone plate and offset printing by the Andrew H. Kellogg Company.

CHAPTER XVII

Offset Lithography—The Most Modern Process of Reproduction

An essay by

ANDREW H. KELLOGG CO.
New York City

BEFORE Michelangelo Buonarroti attempted the frescoes on the Sistine Chapel at the Vatican he had become famous as sculptor, architect, and mural decorator. Exact knowledge of all the factors involved made his paintings immortal.

The artist of today can well know as much as possible about the processes of reproduction that bring his work before the public. Today such supplementary knowledge is even more important than heretofore, for today it is not the work itself that the public sees but the results of reproduction. Any knowledge of the relative merits and requirements of various processes which the artist may have benefits those who are trying to help him, and thus his work as a whole.

A conspicuous instance is J. C. Lyendecker, whose knowledge of lithography gained by

years in a lithographic plant enabled him to revolutionize poster art.

Today artists are helped by a patron more generous than any Art has ever known, the Advertiser. Artists are reaching millions. A great industrial age allows them no longer to place their work upon ceilings—buildings come up and down too rapidly. But none the less they play an inspiring part in their age, and will want to keep abreast of each new advance in reproduction that helps their work.

Such an advance is offset printing.

In a short article it is possible to do little more than indicate what offset accomplishes in color work, in wash, pencil, charcoal, and line. Results are what interest the artist, and the technical side may be merely outlined. Economy is what the advertiser naturally considers, and this conspicuous feature can, therefore, be explained.

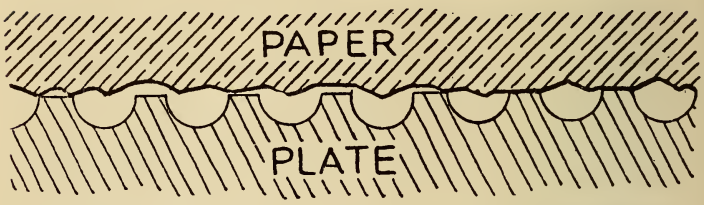
In color work, the artist's objection has rightly been taken to the shiny surface of coated paper which it had been necessary to use in connection with the fine half-tone screens employed in the color plates, when printing was the medium. In lithography, he has, in addition to this, objected to the lithographic artist who has stepped in and inter-

preted his work upon stone. How many advertisers, too, have approved of a painting until they saw it lithographed!

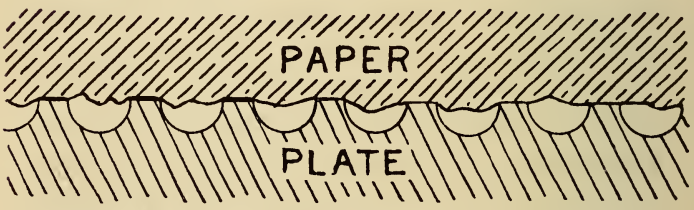
Would it not be much more pleasing to the artist to have his color work reproduced on a rough Antique paper? This, however, is not practical by the letterpress, for, if too light a pressure is used, only a part of the half-tone dots print. If too much pressure is used, the dot is smashed into the paper with a resulting muddy, heavy appearance. The usual method of overcoming these obvious difficulties with the letterpress is to employ a very coarse half-tone screen, 85 or even 65. These screens will print more clearly but naturally the dots are quite prominent and not suitable for high-class work.

The offset not only removes objections, both to the coated stock and the mechanical copying of the lithographic artist, but it also does away with the coarseness of half-tone work on Antique paper. To understand why, let us briefly study for a moment the operation of the offset press.

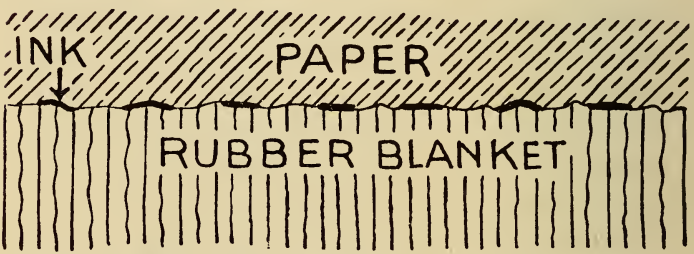
Consider three cylinders revolving in mutual contact. The upper one is the plate, the middle is the rubber blanket, and the bottom is the paper. The impression on the plate is



120 line screen half-tone enlarged approximately 60 times, printed with too light pressure on uncoated stock. Note that many of the dots are not printing.



Too much pressure will smash the plate into the paper and create a heavy and mushed appearance of the dot.



The impression from a 120 line half-tone screen printed by Offset Process on rough paper, showing how each half-tone dot of the original plate is pressed firmly into the pores of the paper.

→ *Page One Hundred and Forty-eight* ←

printed on the rubber blanket, dot for dot, just the same as the pots of the original plate. As the cylinder revolves the print or impression comes in contact with the paper, which is held to the pressure cylinder by means of a row of grippers similar to those used on the usual cylinder press. When the ink impression on the rubber blanket comes in contact with the paper each dot or line is pressed into the rough surface of an Antique paper without smashing or spreading, but with a clean, sharp impression.

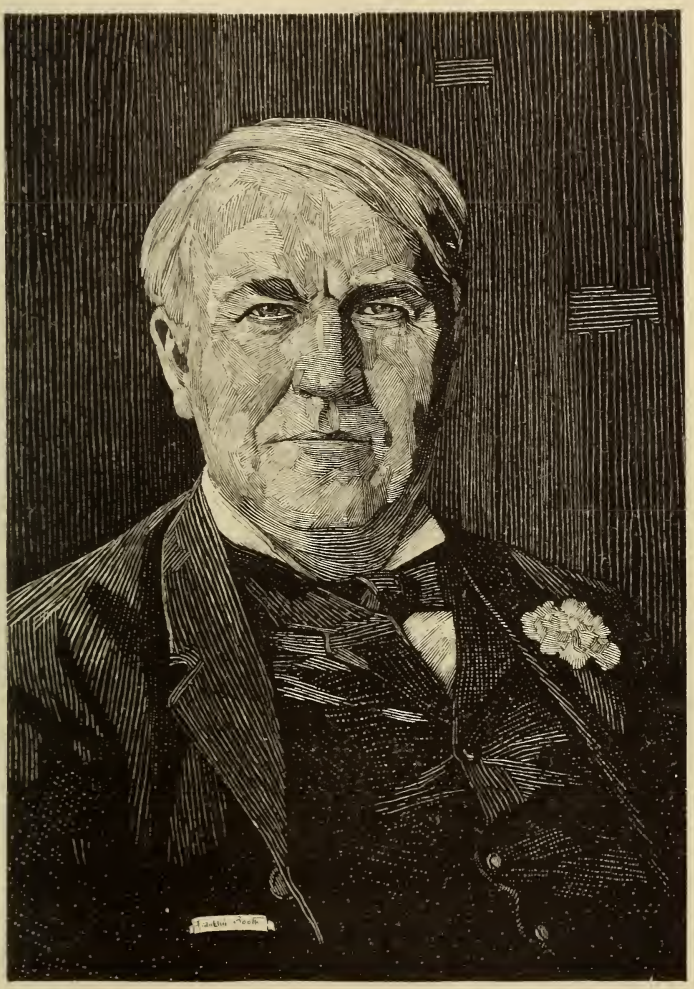
The pleasure that an artist experiences in seeing his work reproduced by offset comes from this use of rough Antique paper.

The rough surface and the dull finish increase the brilliancy of color, and add depth as well. The roughness gathers the light and casts small, almost imperceptible shadows which practically obliterate any suggestion of screen. Offset will preserve the fineness of detail and the delicate line work of the half-tone plate—getting the full value of the plate and at the same time the full value of the texture of the paper.

The dream of using rough paper for the reproduction of fine color work in printing began to be realized about twenty years ago, with the

REPRODUCTION

Pen and Ink drawing by Franklin Booth, reproduced by the courtesy of Thomas A. Edison, Inc. The sharpness of detail is still preserved, although the plate is about one-quarter the size of the original drawing. Offset plates and printing by the Andrew H. Kellogg Company



Sections of progressive proofs of four-color plates reproduced on opposite page showing the four colors used and the result of imposing one color over the other.

Reproduction from water-color copy by Offset Process in four colors. Offset plates and printing from the Press of the Andrew H. Kellogg Company.

REPRODUCED BY COURTESY OF
GEORGE H. DORAN COMPANY
PUBLISHERS · · · NEW YORK

Combination Pastell and Conté crayon drawing, reproduced by the permission of the artist, Mr. C. D. Williams. Offset plates and printing by the Andrew H. Kellogg Company

trial of the first offset press. Up to that time the letterpress and the stone and rotary lithographic presses had been used almost exclusively in the commercial field. When first introduced, the old-time lithographer saw in the offset press only a means of printing lithographic plates on rough paper. But, as the process developed, the progressive firms realized that less colors could be used, owing to the gradations of shade procurable on rough paper by the offset of even a single color. Usually four colors are sufficient to secure excellent color effects.

The method of duplication of a single plate on the large plate from which the job is to be run is accomplished in the same way in which transfers were made for the stone lithographic presses. The original plate of stone or zinc is rolled up with ink, and the transferer pulls an impression direct from the stone or zinc on to a sheet of India paper coated with a thin application of gum and glycerine. Should it be desired to run the job 16 or 32 up on a sheet, it will be necessary to pull 16 or 32 good impressions from the original plate. Even this method of duplication is being improved by new mechanical means which can be employed by offset houses using process plates. And the

→ *Page One Hundred and Fifty-two* ←

duplicate impression may be printed photographically on the printing plate, without the labor of pulling impressions by hand.

To the advertiser familiar with printing, this means of duplication will appeal from the standpoint of economy; as such duplication by letterpress would involve much additional expense of a set of electros for each plate duplicated. And, from the same standpoint of economy, he should here remember what has been before stated, that usually it is necessary to use no more than four colors for the corresponding result.

It may be well to note here the recognized drawbacks of process plates and half-tones, chief of which is the prominence of the screen formations. An artistic effect is almost impossible with this intrusion of the mechanical. Half-tone plates are used in most cases with offset but, as has been said, the rough paper on which this process allows of printing kills the hard mechanical pattern of the half-tone screen while at the same time preserving, dot for dot, all the quality of the plate.

Because of these manifold advantages in economy, convenience, speed, and efficiency of plate duplication, offset has established a new era in color printing.

The artist needs no advice from us. It is safe to say he will choose offset on artistic grounds. He will prefer it—price aside. For, whatever medium he may use, he can rely upon offset for most faithful reproduction of his work.

Consider the line drawing: its reproduction from an offset press will be as clean and sharp as the lines he so skillfully draws with his pen. It will be hard for him to distinguish between his work and the work of the press. The delicate lines will retain their values. The bold strokes of the brush will stand out as he laid them. The artist has long recognized that line work, supposedly the simplest to reproduce, is not always satisfactory as it comes from the ordinary zinc plate. Upon soft paper, the zinc will smash in, giving undue emphasis to delicate lines, and to the whole work a heavy, woodcut appearance. On the other hand, should a highly coated stock be used, the ink may pull away leaving a ripple which, even to the naked eye, will appear as if a delicate line had become wavy and indecisive. It is usual to blame the engraver in these cases. Some drawings are more difficult to handle than others. All drawings in line receive accurate representation in offset.

The artist does not always work with a pen.

Sometimes every artist, and advertiser, too, has had the feeling—"If this could only go out to the public exactly as it looks in my hand." Most particularly is this the reaction when one is viewing a subtle and beautiful pencil sketch. Perhaps everyone is familiar with such sketches—say, those by Vernon Howe Bailey. On fine, artist's paper, held in the hand they give a sense of delight. Reproduced, they become hard and formal and uncompromising—usually upon glazed paper. Offset will take a pencil sketch and reproduce it upon the same paper on which the sketch was made. The result will baffle a layman who tries to decide between original and reproduction.

What has been said about pencil applies equally to charcoal. Here the heavy black lines, blending off sometimes into the most delicate shadowings, are a test for any process. Charcoal drawings should—and can—be reproduced upon the stock on which they were made. Offset supplies the medium, and the only medium.

When one considers wash drawings, it is notable what added depth and brilliancy are imparted to the whole by using rough paper. Coated paper for half-tones has become so usual as almost to be considered a final and

ultimate achievement. Necessity has heretofore established this convention. As a matter of fact, the artist will be the first to realize that the flat, shiny surface is not in the least artistic. Pick up any magazine and note in the illustrations how the shadows have an opaque quality, oftentimes by their very insistence on exact, fine screening, displaying little imperfections, destructive of illusion. Often the highlights will be tooled. A sky will have perceptible white ridges.

A principle comes into play that is recognized by men who arrange scenery for the stage. They avoid flat tones in the sets because the light hits them and is stopped. The mottled combinations of tones create the illusion of distance and reality because the light seems to have the chance to disappear, as in life.

The warm, rich, pulsating effect of a halftone done by offset should be seen by the artist and laid side by side with the old method in order that he may recognize that here is a new process that gives him new freedom of artistic effect, in color, in wash, in line, pencil, charcoal, or whatever it may be.

To an astonishing degree, offset printing combines practical and artistic advantages of interest to artist and advertiser.

Combination pencil and pen and ink sketch, reproduced by the courtesy of The Linnings. Offset plates and printing by the Andrew H. Kellogg Company.

CHAPTER XVIII

Tint Blocks and Their Practical Use

PRINTING in two colors always costs more than single color reproduction. Consider, for example, if 50,000 sheets were being run, the press would make 50,000 impressions if the job were run "one up." Now, if a second color is added, it is necessary to run the sheets through the press again, which means 50,000 more impressions. And besides this, extra electros, additional make-ready, etc., would be necessary. You do not have to be very shrewd to understand the value of that second color. A spot of vermilion or a touch of one or more of the hundred subtle tints available will enhance the general effect of almost any piece of printing. Some artists will submit drawings for advertising pieces that are cleverly conceived, but when the color schemes are analyzed it will be found that two, three, four and perhaps a greater number of extra press runs would be necessary to produce them.

For typographic purposes, there are many practical uses for the tint block, the two most general being those of decoration and emphasis. By emphasis we mean eye catching

emphasis. To be able to print some small part of a subject in its natural color such as the green jacket of a spark plug, a red devil, a red edge to a shovel or the blue ribbon symbol of a tire concern means genuine added attraction. It is necessary only to thumb through the leaves of any magazine to find endless examples of this kind of color treatment.

If you will refer to the chapter on color it will explain the psychological effects of different colors. You must choose your colors wisely if you would have your booklet come back for a curtain call. Always bear in mind that there is a wide gap between a "Trade paper" advertisement showing a red crane and a "Brochure" setting forth the glories of "Usenough" finger nail polish.

It is not absolutely necessary for the advertiser or artist to be acquainted with the dimensions of color. The division of one color into "hue value and chrome" does not affect them. Let the color printer worry about the technical terms, but let us cultivate a sense of the artistic. John Ruskin said: "Art is the mirror of a Nation's civilization," and if those responsible for the work that needs real judgment from an artistic standpoint will keep this in mind it may help somewhat.

Beware of the overdose of color. Too many direct-by-mail folders or broadsides kill the victim before he has time to open them up. Wild orgy of color and heavy type reminding one of the days before prohibition is surely giving way to the more appealing touch of refinement. Color is sometimes intended to "knock 'em dead" and this is very often the case as it is frequently the means of killing the message.

Tint blocks are admirable for many purposes, but study and intelligent application are necessary if unusual techniques are desired.

Another use of the tint block is the picking out of certain parts of the design from an ordinary half-tone or line plate for reproduction in a second color. A fine illustration of the simple use of a line plate and tint block is found in the Haynes Automobile Advertisements.

The original drawings are made as single units in black, and the artist designates the parts of the drawings to be colored so that the engraver will find no difficulty in separating the colors. The engraver simply makes two identical negatives and when these are transferred to the plates, the black parts are removed from the red plate, and the red

parts do not appear on the black plate.

Tint blocks have a wide range of uses. Their production requires no subtle plate making if a sketch or overlay showing the color scheme is provided for the guidance of the engraver.

Here an opportunity is offered for the engraver and artist to work in close collaboration in order to secure the finest results. It is found that frequently a three-color effect may be obtained by running the second color over the entire design in combination with Ben Days in one or both of the colors.

By the judicious use of tooled whites, brightness and life may be added. In some advertisements of this nature the white is limited to one or two spots representing perhaps a lighted window or reflection.

Through the use of a second color the charming decorative effects can be obtained that wonderfully embellish the printed page. Bright little silhouette, thumb-nail sketches, the Cartouche or decorated frames, richly foliated borders and initials all tend to lend that touch of "dignity" so much desired nowadays.

Use a second color, use two or three, but use two or three second thoughts as well. It costs money to print a second color.

CHAPTER XIX

Color and When

J. M. W. Turner, the great landscape painter, seemed to appreciate the fact that man's paints were limited in their ability to simulate light or luminosity. Although Turner is, in the writer's opinion, the greatest of all landscape painters and those who are familiar with his work have marvelled at his portrayals of atmosphere, nevertheless he realized that to try and paint the sun, unless on the wane or partially obscured by heavy atmosphere, was a human impossibility.

Some writers who have made a scientific study of color believe that color has actually developed from some of the earliest forms of life on this planet and that with few exceptions, color once consisted of foliage green, dull yellow browns, which represented decayed foliage; the greys of rocks and the various dull red, yellow and brown earth colors. Scientists claim that plants which depended on insects to distribute their propagating pollen, used vivid color to attract these insects. (A vampy proposition, some will say.) Nevertheless, we understand that the plants that

displayed the brightest colors were better fertilized and were consequently able to outgrow their less gaudy rivals. But here we have another angle. Plants which had the greatest attraction, possessed the ability to attract from a distance and so animals quickly learned to associate the bright colors of nature with food.

A very interesting thought on this subject can be found in the association of color with animal life. Insects and birds who are able to live in the air and are not subject to concealment, have consequently adopted the brightest colors. Animals that spend most of their time in the dark, have generally a dull monotonous color combination. Again, there are animals of prey who have adopted combinations which lend themselves to concealment, camouflage, so to speak. Children love color, so did the primitive man. We find that color combinations were changed and applied in a more or less harmonious state by the civilization of the different periods. The gaudy colors used by the Indian and African were due chiefly to a lack of cultivation, not as some believe, to the supply of pigments.

Our point is this. Color is used or applied in the manner or according to the needs, civilization and cultivation of the masses.

COLOR AND WHEN

If we were to study color from a scientific standpoint, we should find that color is due to the difference in the length and rapidity of vibrations of ether waves. Those of one length and corresponding rapidity would give a different color sensation from those of a different length and rapidity of vibration. However, we shall not burden the reader with a lengthy explanation of color from this angle.

The attraction of color and its place and value in advertising cannot be over-estimated, but its attraction is favorable only when it is correctly used, which applies also to a correct understanding of its application and reproductive practicality. Playing with color is like driving a car up Fifth Avenue for the first time. You do not know when to stop, which results in either color indigestion or the white slip. When considering color always remember there should be a reason for its use, and the artist should have a thorough knowledge of its handling.

We would suggest using color when practical for the following: which are only a few of its numerous possibilities.

1—As a background spot for a particular article advertised.

2—To accentuate a name, label, or trademark.

3—For an eye-catcher to focus attention on the characteristics of a product.

4—To show a product in its natural colors, but as was mentioned before, it is necessary, after determining the purpose for color, to have a knowledge of its applying principles.

The medium, in which the advertisement is carried, will in some cases decide which colors and how much color can be used. The most effective colors to use as color spots are as follows, stated in their order of effectiveness: orange, red and green in full strength. Tints of Ben Day of these are sometimes more acceptable to the publication, but are less forceful. Trade and technical papers are more apt to accept colors in full strength, or "solid" as they are called in the engraving business.

Although, in all probability everyone is acquainted with the simple rules for mixing colors, we feel that it is advisable to give a short prologue pertaining to the combining of colors, which will tend to explain how multicolored effects are obtained.

Red and Yellow make.....Orange
Red and Blue make.....Violet
Blue and Yellow make.....Green

Red, yellow and blue will make a fair black as will dark blue printed over orange. Violet printed over yellow will also approximate black. Continuing, we might add that tints to match practically any desired scheme may be obtained by favoring particular colors. For instance, a blue-grey can be obtained by mixing tints of yellow and red, with a greater proportion of blue. If a greater proportion of blue is mixed with yellow a blue-green is the result.

In the actual printing of colors, however, certain chemical changes are apt to take place which may hinder the desired results, so no color chart can be adhered to absolutely. The stock used may not have a hard or smooth surface and may absorb certain qualities of color not recorded by the engraver's first proof, which is always submitted on fine coated paper. The only way to be sure of the quality of color that will be obtained in the finished work is to have the engraver pull proofs on the stock to be used. In this way any possibility of chemical change will be detected at the start.

Following are a few words about printing inks used in reproduction to-day. The pigments employed embrace nearly all of those produced by the color-makers, but they are

not all equally suitable for lithographic printing. The three qualities necessary are brilliancy, permanency, and ease of working. Printers will tell you that these qualities are possessed in quite different degrees, by the various colors.

Fortunately, nearly all the most trustworthy pigments can be successfully used for ordinary work which does not require decided permanency, but some of the most brilliant ones are not only unpleasant in use but fugitive in color.

The question of permanency of color is also much misunderstood or considered negligible by many of the color printers of to-day. The demand for cheap inks, and, we will allow for the inability to obtain really first-class inks at this particular time, are great reasons why so many of our productions are disappointing. We might add that the three great enemies to permanency are light, impure air and the chemical action of one color upon another.

There are colors that are recognized as possessing certain mental meanings or mental imagery, and the advertiser will do well to visualize the following examples when making his first "rough." Bright red or crimson suggests heat, love, vitality and passion; dark red

or maroon suggests warmth, solidity and richness; pink suggests daintiness, softness or coquettishness; yellow typifies light and is also a symbol of warmth, happiness and sunshine; blue is used to represent air, sky and has a cold tendency; steel grey suggests strength and hardness of steel and, of course, is indicative of age and dignity.

Color has long been identified as a symbol of national and racial significance, such as yellow for the Oriental, red for the Negro and green for the sons of Erin. Age and sex modify color preference to some degree, and so do seasons, green in the spring and brown in the fall. By a recognition of these rules, the advertiser is in a position to aim at mental harmony as well as page harmony.

There are many manufacturers who even to-day think they are keeping out of trouble by keeping away from color and depending on black and white for every advertising venture. Let it be understood and realized that black and white are not colors and in whatever proportion they are mixed, they produce grey, which is neutral and disenergized. Advertisements of this character are not appealing and seem to say "We are not particular if you buy or not."

REPRODUCTION

Nature everywhere shouts with color, it speaks of life, is the only proof of life. The birds of the air, the fish of the sea proclaim their color lessons. Color is a fact.

Whatever line of business wishes success in its advertising must bow to color.

Color speaks more elegantly than it is given credit for and the goods of many a manufacturer are the victims of an unfortunate or unintelligent choice of color either in the goods themselves or in their containers. Can you imagine a manufacturer of electric bulbs choosing and insisting on dead black and blood red to show off his product? Yet it is so. The correct use of color makes happiness, by making people want to buy certain articles. The wrong use of color provides mental and moral distress and often colic.

Use color, use it as often as practical, but use it and choose it wisely.

CHAPTER XX

The Three and Four-Color Processes

THE three-color process can be defined as a process in which the three primary colors of a painting or color illustration are separated by means of color filters and photography, after which each color sensation is etched on copper and then when the plates representing yellow, red and blue are superimposed when printing, the result is (or is supposed to be) a reproduction of the original painting in all its combinations of color. However it can also be described as the most important development of the half-tone process of making plates by the use of screens.

The theories of color in light and in available printing inks enter largely into this development. We must understand that white or solar light is composed of rays of light of three distinct colors, red, green and violet, which are called the primary or fundamental colors. Because of their combination in various proportions, all other colors or tones of color are produced, but they cannot themselves be produced by any combination of any other colored rays.

The theory of pigmental colors (printers' inks, artists' colors, etc.), differs from this in that the primary or foundation colors from which all others are produced, while being themselves unproducible by any admixture, are yellow, red and blue, and while the combination of the red, green and violet of the scientist will produce white, the combination of the primaries of the inks of the printer and colors of the artist in their full strength will certainly produce a very near black.

Color is the result of the absorption and the reflection of the rays of light which strike upon a body. The rays which are reflected are those which affect the vision and produce the sense of color. Should the object absorb all the rays it appears black, should it absorb none but reflect all, it is white, and between these two extremes lie an infinite variety of tones and colors.

To separate these different colors or rays, the ingenious mind invented the color filter which will absorb and refuse passage to certain colored rays, while permitting the passage of others. For example, a photographic filter of a certain color will absorb and stop the passage of red and green, and permit the passage through it of violet.

Four-color process, showing strips of the progressive proofs

It will then be perceived how, when a picture or other colored object is placed before a camera, with one of these filters between it and the exposed negative, the rays of light of the color which pass through the filter to the negative will be the only ones which can affect it, and it is possible in this way to secure on three separate negatives a record of the green, red and violet rays which are reflected from its colored surface by any object before the camera.

These records are not colored photographs, they are simply ordinary negatives, records of color values which may be translated into color reproduction by the use of colored inks.

The principle governing the process is analysis or separation followed by recombination. Positives are made from these color records, from which, by means of the rule screens already described, half-tone process plates are made, which when printed one over the other in colored inks, combine again the colors which were separated by the filtering process and give approximately a reproduction of the original in its true colors. The color used with each block must have a relation to the filter used in its production. It must represent a combination of the two colors stopped

out by the filter when making the negative from which the block was made, that is to say the color used must be complimentary to the colors stopped out. Certain subjects which are amenable to long exposures can be dealt with by what is known as the "Direct Process," whereby the screen negative and the color record are made by one operation on the same plate. By this means, six of the fifteen otherwise necessary operations are saved, but the method is not always practicable.

As far back as 1861 the suggestion was made at the Royal Institution by Clark Maxwell, to reproduce objects in their natural colors by superimposing the three primary colors. Later, Baron Ransomut of Vienna, Mr. Collen, a gentleman who taught drawing to Queen Victoria, and two Frenchmen, MM. Chas. Cros and Ducos du Hauron, carried on the idea and made experiments with the aid of photography which were still further developed in Germany by Prof. Husnik of Prague, Dr. Vogel of Berlin, and others; but it was in America that the first three-color plates for printing were made, by F. E. Ives, at Philadelphia.

This three-color process has made great advances in recent years. The first great practical difficulty which had to be overcome was to

→ *Page One Hundred and Seventy-two* ←

The four-color process. By the Courtesy of Huntzinger & Dilworth, New York. Plates by the Sterling Engraving Co., N. Y. C.

produce three screen plates which could be printed one over the other. Were the screens of each block used at the same angle, the lines and dots would print on top of one another, but a great deal of the color result depends upon a considerable proportion of each color being on the white paper. Artists know that much purer and more brilliant colors are produced by placing touches of color side by side than one over another. For instance small patches of red and blue, placed side by side, yield to the eye a purple of much greater purity and beauty than the same touches of color worked over each other.

Consequently it was found necessary to turn the screen at a different angle for each plate, so that the lines should not fall on each other, but the risk of this is, that used at certain angles, the crossing of the screen lines will produce what is known as the "Moiré Antique" result. Vogel took out a patent in Great Britain for the process, and he therein stated that the screen should be used at certain stated angles. He also proposed to use single-line screens similar to those used by F. E. Ives at Philadelphia, instead of cross line, but it has since been found that the cross or double-line screens can be used successfully and that the

angle at which they are to be used is not a fixed one.

Filters are made in dry or wet forms. The dry filter is made by spreading a film of gelatine or collodion tinted by an aniline color, upon a piece of glass. The wet filter is a cell or trough made of two sheets of glass sealed all around and filled with water tinted with an aniline dye or color. The accuracy of the tint of the color-filter may be tested by the spectroscope, or an instrument invented by Sir William Abney, and known as the Abney color sensitometer. This is a theoretical test. The practical test is by photographing through them patches of blue, red and yellow. If, for example, the filter of blue records the full strength of blue with the full strength of the color of the negative, while giving slight or no record at all of the red and yellow, it is practically a true filter. It is possible to treat the negatives themselves so as to render them more sensitive to the special color they are intended to record. Indeed, Dr. Albert of Munich has produced a collodion emulsion which is so sensitized that the various color sensations are directly obtained without the interposition of the color filter. Different makes of plates demand different color filters. The

preparation of these color filters calls for great perfection of quality in the material employed, and great accuracy in the using of them. The glass, whether for the dry or wet filter, must be absolutely flat as to its surface, and its two sides must be absolutely parallel. In the wet filter, the glasses forming the sides of the cell or trough are parallel to each other.

Colored glass is sometimes used in combination with the colored collodion, but there is no particular advantage in this, because two glasses are always used in the making of a filter, and each one may, if desired, be coated with different dyes and afterwards cemented together with Canadian balsam.

The following dyes or their equivalents form a basis for nearly all three color filters:

For the red printing negatives: Green Yellow.

For the blue printing negatives: Red Yellow.

For the yellow printing negatives: Violet Green.

The first dye named is the base color in each case, the second being employed in small proportions to produce the required modification of tint.

The theory of the three-color process is that the same three colors should be used for the

printing of every subject, and there is no doubt that if the filtration were perfect and the printing inks absolutely pure, the theory would work out fairly correctly in practice, but there is room for improvement in both these matters, and it is therefore often found desirable to print special subjects with special pigments, which makes it difficult to print several subjects together. Special care is called for on the part of the printer. There must be the most perfect register of the three subjects, otherwise a blurred effect results. There must be constant watchfulness to see that there is no excess of ink of any one color, or the whole scheme of color will be destroyed. This three-color process has been rather a long time in establishing itself and nothing has so tended to retard it as bad printing. Good plates have been obtainable, but in the hands of ordinary printers they have yielded but indifferent results. It is hardly to be expected that the untrained eye of the ordinary printer should be successful where the work requires the cultivated judgment of an artist. There is one other necessity for success in all tone work and that is the use of the right quality of paper and ink. The plates are so delicate that they soon fill up if an excess of ink is used. Ink of a good

quality can be used in much less quantity than common kinds, but it must be impressed upon paper that is sympathetic and will bear out the ink.

The best results can be obtained only with the use of what is known as coated paper. It is a paper which, after manufacture, is passed through a bath or preparation of china clay, which, by means of brushes, is rubbed into the surface of the paper. When dry the surface takes a high polish and is sensitive to the smallest amount of ink. The polish of this coated paper is objectionable to many readers of illustrated books and the clay adds considerably to the weight. Paper makers are, however, supplying a dull-surfaced highly calendered rag paper which is very good for artistic and scientific illustrations and obviates both the glossy surface and the supposed lack of permanency of coated paper.

The following are a few important details that should be known. They are probably infringing in technical phraseology, but should nevertheless be understood.

Illustrations in which there is a quantity of blue are photographed through a red or yellow filter. This makes the tone value practically as the eye sees it. To obtain a plate for

yellow parts of the illustration, a violet filter is used and then a green filter for the red plate.

The angle of the screens varies for each color so as to avoid the pattern or moiré effects that would result if the screens were used at the same angle. The blue plate is usually taken with the screen angle at 45 degrees (this is also the angle used in making a straight half-tone to print in only one color), the yellow plate with the screen angle at 30 degrees to the right of the perpendicular and the red plate with the screen at 60 degrees from the perpendicular.

In the case of the four-color process, an additional plate is used, this being generally a black plate. Better results are naturally obtained by the use of four colors, especially where there are many shades of grey or neutral tones, brilliant blues and greens and solid black. These colors are impossible to get when only the three primary colors are used.

In the four-color process the black plate is usually the key plate, thereby giving strength to the detail of the subject. In the three-color process it is necessary for all three plates to carry correct color values and graduations to obtain really satisfactory results, whereas, in the four-color process, parts of the finer detail left to be brought out by colors in the former

process are carried in the more definite black key plate.

The filter used in making this black key plate is uncertain, depending solely on the nature of the subject. Sometimes an orange filter is used or it may have to be green or yellow. The angle of the screens also changes from that used in three-color work.

The engraver of process color plates always has in mind, when making the plates, that they are to be used on high-grade coated stock. When the advertiser is going to use a dull-finished white or tinted paper, the engraver should be advised of the fact and a number of sheets of any special stock should be furnished him so that he may pull proofs on the actual stock to be used. The screen manner of etching and color combinations are all affected by the use of unusual stock.

Process color plates are, as a rule, made with either the 133 or 150-line screens, but special work requiring different screens than these can be accomplished.

All these processes are attended to by men who specialize in some particular branch of the work. For instance, the man who takes the negative is seldom capable of doing expert work in the etching department, for the man

who etches is also a specialist in his line and so on through the various branches of reproduction.

The following essay will naturally explain more of this wonderful process, and the viewpoint will be appreciated.

CHAPTER XXI

Complications Connected with Color-plate Making

An Essay by

THE STERLING ENGRAVING CO.

New York City

MODERN miracles take place in photoengraving establishments daily, though little notice is taken of them, because they are so common. I refer to the reproduction in three or four printings of all the colors of the rainbow and, besides, many colors that never were in a rainbow, from Noah's day to our time.

If advertisers, artists, publishers and all of those interested in color printing but knew some of the complications connected with color-plate making, they might restrain the artist, instead of encouraging him into freak flights into the realm of color, frequently impossible of reproduction. They would also have more respect for the paper maker, ink maker and pressman, but, above all, congratulate the photoengraver for his marvelous accomplishment, which frequently does border on the miraculous.

Without going into the intricate optical and other scientific questions, I will review here

briefly just a few of the more easily understood problems that enter into three- and four-color plate making. This is done in the hope that through a knowledge of them the artist will co-operate with the photoengraver toward better color printing and the advertiser and publisher will not expect miracles to increase at their command.

When William Kurtz, at No. 6 East 23rd Street, New York, made the first practical three-color plates by photoengraving, it should be remembered that it was but a few years ago and the improvements in the art that have taken place since are equal to those that have taken place in any of the revolutionary discoveries of our period in history. These first three-color plates made by Kurtz were published as a frontispiece in the *Engraver and Printer*, of Boston, for March, 1893, with this title: "Photography in Colors. Taken from Nature, by W. Kurtz, Madison Square, New York. Printed in three colors on the Steam Press." This picture made a great sensation, of course. It involved more invention than the voyage of the *Clermont* up the Hudson River, as the first propelled steamboat, or the flight of Orville Wright in the first heavier-than-air machine. Today three-color plate

making is looked upon as a matter of course, like the steamship and aeroplane. When one considers, in Kurtz's day, the lack of modern scientific lenses, aniline dyes, photographic plates, colored inks and printing presses that would register, then this pioneer three-color printing of Kurtz does enter the marvelous.

Just as soon as the work of Kurtz was shown to the world, far-seeing men sensed the possibilities of this wonderful invention, in education, advertising and civilization itself. Like a rush to newly discovered gold fields, inventors, scientists and artists began to study how they could improve upon it. Experiments then began, have not ended yet, though of late they have been concentrated on "movies" in color. Great fortunes have been burned up in color photography. One woman admits to having sunk nearly a quarter million dollars. Little publicity was given to these losses, though we are all enjoying benefits from these unknown experimenters, through the beautiful color printing we enjoy today.

It is only those who give their lives to color-plate making that understand the evolution that has been brought about in the making of aniline dyes, color filters, lenses, photographic plates, electric lights and the artisan's skill

during the past quarter century. While there is one important factor that has not improved, and that is color vision. In fact it is said that normal color perception is decreasing, owing to the increased use of tobacco. As there are no two pair of human eyes that have precisely the same sensitiveness to all colors, one can appreciate how important this question of partial color blindness is in discussing this subject.

Let us consider for a moment a few of the effects of varying color vision and the difference daylight and its substitutes have on this question of three-color reproduction. The artist usually paints his picture to be reproduced, in daylight. The engraver either photographs the artist's painting in daylight, or illuminates the painting with special electric lights that approach daylight as closely as possible. The engraver's proof of this painting should be compared with the painting in daylight, for several reasons. One is that the incandescent electric lights, under which the comparisons are usually made, vary so in the light rays which they emit. Some electric lights are rich in yellow rays, then they may give off violet rays, which are destructive to so many colors. The artist's paints and the pigments used in the inks are composed of differ-

ent chemical elements which vary greatly when viewed by daylight or these vari-colored electric lights. Every artist knows how artificial light will change his color schemes; he should also know that the pigments in colored printing inks change in hues, but in different ways from those of his paints.

The source of most of the trouble which we photoengravers experience in the reproduction of commercial paintings is the advertiser. He too often asks the artist for "Something that will knock your eye out." He gets what he wants, though it knocks much money out of the engraver's pocket before he gets it reproduced in three-colored printing inks. The advertiser has a weakness for "Peacock Blues," "Emerald Greens," "Royal Purples," "Persian Oranges," "Golden Yellows," etc. They sound rich to him and he thinks they will give him his money's worth. Questions of artistic harmony, contrast, balance, composition and beauty he is not concerned with. He wants a picture that will shock one into taking notice of it and the result is shocking. The artist knows better and so does the advertising agency, but in the endeavor to please the buyer-advertiser, they allow all the rules of good taste to be set aside and give the adver-

tiser in the painted original what he wants and then the engraver's trouble begins.

All the effects the advertiser seeks could be obtained if we were permitted to use two reds, two blues, a yellow, gray and black printing blocks, making seven printings, as the lithographer does, but the engraver is confined to three colors and a black. Could each piece of color work be printed separately, it would be possible for the photoengraver to manipulate the engravings and so mix the printing inks as to satisfy the most critical, but color plates from different advertisers and engravers must be gathered into the forms of magazines and printed with identically the same inks on the same paper stock, regardless of the different color schemes of the artists. Is it to be wondered at that there is some complaint when one considers that if all these artists' original paintings were hung together on the same wall it is not likely they would harmonize.

To bring about harmony in the printing of three-color process blocks, produced by different engravers, the American Photoengravers' Association adopted unanimously standard three-color inks and all users of color printing should know the reason for these precise hues chosen. They are the result of twenty-five

years of daily practical experience. Every possible combination of hues has been tried and the hues adopted by the convention are the ones that have survived all tests. These inks are made from pigments that will best stand exposure to sunlight; the ingredients of which they are compounded can be ground sufficiently fine and will mix perfectly with the linseed oil and varnishes that bind the pigments to the paper. Further they will work satisfactorily on the press by laying smoothly over each other.

As to the hues of the adopted inks, the yellow contains no red, being what is known as a pure lemon yellow. The red ink contains no yellow, in order that pinks and purples may be produced with it; the blue ink is as free from red as possible. Every artist will recognize that with these pure primary colors, the secondaries and tertiaries may be had, as they are mixed on his palette with this difference—that as his paints are usually opaque, the primary printing inks must be transparent, with the exception of the one printed first, which is usually the yellow. Another thing might be mentioned here. The artist usually presents his painting in a suitable frame, while the engraver shows his proof with a wide border of ghastly white paper around it, which shocks

one at once. If engravers' proofs were seen only with a gray mat, how much more acceptable they would be!

Fortunately for all concerned a great change is going on in the attitude of the artist-painter toward advertising. He finds that "Art for art's sake" does not pay as well, sometimes, as art for advertising. Painters frequently furnish the most satisfactory copy for three- and four-color reproduction, though they are most critical of the result. We photoengravers welcome the Raphaels and Titians of our day to advertising art and believe they will be as successful as Joe Lyendecker, Maxfield Parrish, Coles Phillips, and others are when they learn by experience what not to do and lay their palettes accordingly.

To the painters who contemplate turning their talent to advertising art, to experienced illustrators, to advertisers and agencies, these few lines, giving an engraver's view-point, are offered in the hope that all may learn something regarding the obstacles in the way of the photoengraver. That they may "be a little blind" to the slight failures in reproduction, remembering Pope's lines:

"He who expects a faultless piece to see,
Expects what ne'er was, nor is, nor e'er shall be."

→ *Page One Hundred and Eighty-eight* ←

CHAPTER XXII

The Prismatone Process

"WONDERS will never cease." "Prismatone solves color problems." "New process of gravure in color without the use of screen or color separation negatives was invented by 'Father' of the Rotogravure process." Such are the first startling announcements made of this wonderful new process of reproduction that is bound to revolutionize the industry.

When an inventive genius brings forth a new creation in any field of endeavor, the spotlight is turned on for a while only to be refocused on another seemingly more worthwhile offering from some other source. This generic process of reviewing the progress of achievement goes on indefinitely and here we come to pay tribute to the greatest of the present-day developments of the printing industry.

The printing industry was already advanced to a high state of efficiency; inventions have been brought to light that have startled the cleverest in the field. They have been kept continually on the watch to learn what was going to happen next and each improvement

has brought forth heartfelt approvals from everyone.

Perhaps in no other line of industry has there been a more rapid development than in color reproduction. Great strides have been taken in this particular work and apparently there is no end. Prismatone seems to be the acme in this field. It has extraordinary advantages over all existing color-printing processes, and there is a vast field in all branches of commercial printing open to this wonderful new process. It has always been maintained that the time would come when there would be a radical change over the processes of the past and as soon as the work of Prismatone is seen it is convincing that it has solved a great problem of color reproduction.

It is the product of Charles W. Saalburg, who is sometimes called the "Father" of the rotogravure process universally used today in the printing of pictorial supplements of daily and Sunday newspapers. It is described as a process gravure in colors without the use of screen or color separation negatives and, it is claimed, will solve all problems which have heretofore prevented the successful production of pictorial color work.

By this process exquisite color work from

an ordinary photograph or exact reproduction can be made from color drawings, paintings, or life. All previous attempts to develop color gravure have proven futile, owing not only to the tremendous expense involved, but to the technical difficulties encountered, paramount of which being the impossibility to secure good register. Not only is Prismatone of a higher quality than anything heretofore attained, but can be produced at a lower cost than lithography or any other color process.

Prismatone eliminates the cost of making expensive color sketches. All that is necessary is a black and white drawing or photograph. There also is a great saving in the cost of original color engravings, electrotypes and "make-ready," always necessary in printing on letterpress machines. There are no electrotypes or make-ready in the Prismatone process. Particular attention is directed to the colored newspaper illustrations, which are another triumph for this process. Never before has anything even approximating these results been attained with ordinary newspaper stock, making it possible for publishers to display the latest news in full color—a truly remarkable accomplishment.

The press will print on both sides of a sheet,

four to eight colors in one operarion, at a speed of from 3,500 to 8,000 an hour and will print on newspaper stock at an even greater speed, made possible by the use of a very quick drying ink perfected by the inventor of the process and which eliminates the possibility of smudging, yet retaining all delicate shadings, tones and colors. The presses will not only print, but can also fold and deliver the sheets ready for insertion in newspapers or magazines.

One of the most remarkable things about it is the result you get on the commonest kind of stock. Where other high-grade printing requires specially made paper, the Prismatone process laughs at the difficulties the engraver and printer encounter with ordinary grades of stock. All papers look alike to Prismatone. It is the only process that can boast of the three primary factors of price, quality and speed.

In reviewing the possibilities of the process with the inventor himself, the writer was shown how the simplicity of the whole idea made it practical and economical. The strength and wearing qualities of the etchings will outlive any other form of plate; this is due to the remarkable manner of etching. The cylinder is somewhat similar to the rotogravure inas-

much that it is an intaglio plate and the doctor knife is also part of the machine's equipment.

The outstanding features of the whole process seem to be as follows:

The camera is not an essential part of the equipment; it is not used to impress the images or copy on the cylinders. In some cases, however (for there is more than one method of procedure), the camera is used to make just one negative and then a positive. Never is it used to make the sets of negatives and positives ordinarily required for the different colors, as in other processes. Only one negative is used in Prismatone when the camera is used at all.

Prismatone does away with the old style intaglio screens which are made up of squares of varying areas and depths, the dark portions of the subject being carried by the larger and deeper areas and the lighter portions by smaller and shallow areas. It is claimed that these small, shallow cavities were always liable to be injured by the action of the constantly working doctor knife, sometimes disappearing altogether when the run was long. The great secret of the new process is the application of a grain to the printing surface, the depth of each cavity being exactly the

same, no matter how large or small the area. This is the reason for the practically unending wearing quality of the plate.

The grain method of printing has no ruling or pattern whatsoever; there is no chance of bad register or of forming a bad "pattern," the use of only one negative doing away with all chances of such. Imagine the saving of time and expense of such a process!

In the method employed of putting the images on the cylinders without the aid of the camera, it was pointed out how it is impossible to have the plates out of register and how it differed from the old method of carbon transfer by being a *direct* method. It is well understood how the carbon transfer can, on occasions, become erratic. It must be dampened when it is sensitized and again saturated with hot water when transferring to the copper cylinder and any one experienced in the work will tell you how the weather will affect the carbon paper. It is claimed that the Prismatone process is absolutely reliable in this respect, as no water or chemicals are used in the method of transferring.

Mr. Saalburg says there is no such thing as hit-and-miss in this process; it is just "hit" all the time. There is no doubt that it is a refined

process, for elimination is the keynote of the whole procedure; everything that savored of trouble was cleverly eliminated from the start.

We shall hear more of this soon and moreover we shall soon *see* more of it, we know, for we have seen.

CHAPTER XXIII

The Purpose of the Matrix

An essay by

THE SCHAEFER COMPANY

New York City

THE Matrix plays its own truly important part in the ever-growing field of advertising activities. It is the most economical means of duplicating plates, but is often unappreciated and not given the consideration and credit to which it is entitled. The reason is this: entirely too much is asked of the "Mat." All advertisers have learned that the 133-line half-tone is not suitable for newspaper work and it must be understood that the matrix also has its own limitations. When mats are to be used, the artist should be familiar with the fact and make his drawings accordingly. Too much fine detail will not produce the desired results and the artist must learn sooner or later just how far he can go to enable the matrix maker to perform his share of the work without handicap.

The advertiser is very often unreasonable in expecting the matrix, which, as we said before, is the cheapest means of reproducing, to reproduce something for magazine work or the

higher class of printing equal to the more expensive duplicate plates. When he does not get the desired results he condemns the matrix. This is not the fault of the mat, but the inexperience of the user.

Newspaper work seems to be the big suit of the matrix and in this it is unquestionably a practical and economical procedure.

If the drawings are practical for newspaper printing (and to be practical they must be simple), the matrix will be. Newspaper printing is rapid and rough and the simpler the detail, the better the results. Study the matrix; test it out. You cannot drive a Ford a hundred miles an hour, but you can get service and economy out of one.

Speaking of the facilities of the newspapers to handle a matrix, altogether there are about 19,000 newspapers printed in the United States, but of this number only 2,800 are in a position to use mats at all, and only about 1,050 of these are equipped to handle them properly and get good results. It is easy to understand the limitations of the matrix from this angle, and although a great many small newspapers have casting boxes and make vain attempts to make use of the matrix, the results are in many cases poor and consequently

disappointing to the user and condemning to the maker.

The 1,050 first- and second-class newspapers throughout the country are equipped to handle mats correctly; they have rotary presses and complete stereotype outfits. This work requires skilled operators and skilled operators require and demand good mats.

The question arises: "What is a good mat?" A good mat is made from the proper materials and given the proper care in making. It is composed of two layers of blotting paper and two or three sheets of the finest grade of tissue, made especially for this purpose. These are put together with a special paste. Of course there are different grades of paste, tissue and matrix paper, and many mat makers are using an inferior grade of material to enable them to sell at a low price, with the result that they make a poor mat. A mat that is shallow will not reproduce clearly and is apt to blister when a cast is taken from it, the result being that the advertiser trying mats for the first time, is disappointed and will not give them a further trial.

This apparent libel is an injustice to the conscientious and practical mat maker and if the same rule were used in condemning other

poor examples of plate making, it would end quite seriously for many photoengravers.

How is a good mat made? The process of making a mat is a simple one. The original cut is laid on a flat slab of metal. Strips of metal the same thickness as the cut are laid all around it,allowing the stereotyper to make his cast without injuring the original. The slab is now rolled through a matrix roller, the cut receiving a pressure of 6,000 pounds through a felt moulding blanket. The metal slab is then placed under a steam-heated drying press and the mat allowed to dry three or four minutes under a pressure of 25 tons. If this work is not given the proper length of time,the result will be visible in the mat. It must dry under pressure or the paper will not adhere properly, nor will the detail be clear and sharp.

There are very few concerns in the United States to-day who are making matrices, as they should be made, too much attention being given to speed and price. The properly-made matrix will reproduce a newspaper advertisement when given the care in making. Our own experience with newspapers has shown us that a well-made mat is received and handled by the local stereotyper with more care than an inferior grade of electrotypes.

Like every other economical product, the mat is condemned because of its apparent simplicity. As an experiment, let any advertiser send out a certain advertisement with suitable illustration adaptable to the mat with the same number of electrotypes to newspapers of the same class, and note the result.

The reproducing of the half-tone in matrix is generally believed to be practically impossible, but when it is remembered that the only half-tones used in newspapers and rough printing are those of coarse screen, it is understood that they are adaptable to this method of duplicating. The advertiser who uses more than a 65-line half-tone for newspaper reproduction is taking a big chance of being keenly disappointed at the result.

We know that a matrix can be made of a half-tone of 55 to 65 lines that is practically fool-proof and the advertiser must realize the economy of such a process. If the advertiser will select suitable illustrations, specify the correct screen and insist on a good deep half-tone plate, he may be assured that a good matrix will give splendid results.

A list of newspapers, about 1,600, which can Rateuse mats safely is issued by the Standard and Data Service. This list

covers the larger cities of 30,000 or more in habitants.

Good subject for illustrations and the proper selection of the newspaper list, combined with well-made mats of good material and workmanship, make it a safe and economical method of reproducing advertisements.

The difference in regard to the cost between a really high-grade matrix and one of the cheaper variety, is too small to be considered, it should play no part whatsoever and the matrix that will produce and give satisfactory results should be demanded just as other good elements of the whole advertising scheme are sought after and demanded.

There is another process of matrix making, known as the dry mat process, which, we feel, will ultimately supplant all other methods. It is a German invention and seemingly not as yet past the experimental stage. During the period of the war, several American firms made them, but none that we have seen can compare with those made in Germany and England. These are again being imported into this country, but at a prohibitive price.

While the dry mat will reproduce well, there is an inclination to buckle very easily when the cast is taken, which of course makes them,

to a certain extent, unreliable and unsafe to send out. However this important feature, no doubt, will eventually be corrected and overcome.

Strictly speaking, the present dry mat is not practical for syndicate mat purposes and although the foreign mats are in many ways far superior to the domestic made mats, the odds are against them. The high cost of importing, unreliability and the cost of material, which is about three times higher, are big items when considering the matrix as chiefly an economical product.

The process of moulding the dry mat is exactly the same as in making the wet or ordinary matrix with the exception that they do not need to be dried by heat and are sent out just as they are moulded.

CHAPTER XXIV

Crayon and Charcoal Drawings

THE reproductive qualities of crayon and charcoal, either for line or half-tone, are excellent. It is a fairly new technique and if wisely handled and the size reduction is not too great, is sure to obtain pleasing results from the engraver and printer.

There is, however, a subtle suggestion of atmosphere in the free, sketchy illustrations, which is quite a relief from the general run of conventional stuff and worked to death pen and ink.

The only objection worth making is the tendency to smudge if care is not taken of the original drawing until the engraver has done his part. For this reason, it is always advisable to have the drawing made on stiff rough-surfaced board, especially where line plates are to be made.

The artist, in this case, should guard against indirect handling which is apt to be dirty, for it is unfair to ask an engraver to make a line plate from a charcoal drawing, when there is evidence of indistinct grey or washed out lines. If the drawing were for half-tone repro-

duction, these would not be objectionable.

Drawings of this nature, made on smooth surface paper or board, will generally require half-tone plates, and these are only suitable for printing on coated or smooth stock. A novelty of technique can also be had by putting an all-over tint of grey on the whole drawing, and having the whites "tooled" out on the plates in order to accentuate certain parts of the composition, or for high-lights, windows of buildings, etc.

These should be designated on the drawing by the artist. There is a process of plate-making known as the "High Light Process," which is excellent for the reproduction of this class of illustration. This process is described in the chapter on "Half-tones," page 28.

CHAPTER XXV

Silver Prints

IT perhaps sounds a little off the subject of reproduction to talk about silver prints, but a short discourse on this old but apparently unappreciated method of making a true to life copy of practically anything from a bull's foot to a bird's-eye view of a whole industrial district will be useful to the advertiser.

We feel that where the artist does not know how or when to use a silver print, it is up to the advertising man to know.

When it comes to speed, the silver print takes the cup. It takes about twenty minutes for the photographer or engraver to make one from any original photograph, and when the artist has finished his job only ten minutes more is required to bleach and thoroughly wash the print before it is ready to "shoot."

Silver prints can be enlarged or reduced from the photograph to any size and made to any degree of strength to suit the particular need of the subject or the desire of the artist. Here we might add, there is a chance for the artist's genius, to put in and leave out such parts and detail in order to give the best re-

sults. Some men find it easy to bring out fine qualities of technique. One artist expressed it as "just like eating pie." It is equivalent to tracing on a photograph, but as we said before, it is knowing how much to put in and how much to leave out, that proves the genius.

It would perhaps serve a purpose to explain a few of the most important points of handling the silver print itself, so as to keep it from giving a patched up appearance on the drawing and to preserve it for filing.

After the silver print has been worked over by the artist, it is bleached out and all that is left is the actual work of the artist in ink on the bleached white photographic paper. (It is sometimes advisable to let the advertiser see the unbleached job, where the subject is difficult and contains an amount of detail, as in some mechanical subjects.)

An artist should obtain a bottle of the necessary bleach to keep in his own studio, so that he will not be compelled to resort to the engraver to bleach his drawing. He will probably have to secure it from an engraver, as "Cyanide of Potassium" is a deadly poison. The greatest care should be taken in its use. The hands should be thoroughly washed after using and should be free from cuts and

Illustrating the use of the Silver-print, the lower part being unbleached. Courtesy of Paul Pandolfi, Rome. Combination plate by H. C. Jones Engraving Co.

scratches, which might become infected. Immediately after bleaching, wash the print in running water for four or five minutes to remove every vestige of the fluid. Careful washing is the secret of a white print. The result of careless work is a yellow, sickly job, which gets worse as it gets older. The best method of washing is to place the print on a piece of glass and keep it under the running faucet.

Do not have the prints made until the artist is ready to work on them, and try to keep the sun or any other strong light from them as this makes them turn dull, and probably too dark to work on, besides obliterating fine detail. Completed drawings should be filed in a cabinet and in the dark, if they are to be kept from deterioration.

In a recent article in *Printers' Ink* monthly, it is explained that a special rough-surfaced board is obtainable on which silver prints can be made.

This makes it possible for those who wish to use crayon to obtain good effect as the grain of the board provides "purchase" for this popular medium.

The bleaching qualities are exactly the same as those of the conventional smooth surface print.

CHAPTER XXVI

"The Reducing Glass"

THE reducing glass is a help in some cases but is apt to be misleading and treacherous, if used as a means of judging the printability of drawings. The glass will permit a reduced view of the work, but the difference between the keen exactness of the eye and the actual printing of the plate on paper provided by the news presses, for instance, or on coarse stock with poor ink, is as different as a "Lizzie" and a "Rolls Royce."

It is not possible to lay down a rule for the amount of reduction to be made when photographing for the reduction: the finer the detail the less should be the reduction made, but experience is the only guide. The reducing glass will portray a clear, bright impression, in miniature of the original drawing, but it does in no sense make any allowance for the loss of detail caused by mechanical reproduction. It is common knowledge that in 95% of photomechanical reproductions the tendency is to lose rather than to add to the appearance of the original subject.

Faulty drawing is not lessened by reduction. On the contrary, the fault becomes more evident.

If you must know what it looks like, there is only one way. Have a "trial" plate made of one of the series and prove it on the stock to be used. This is the only way to prove technique, printability, composition, and its power of display. You can probably save money, too, by adhering to this rule.

CHAPTER XXVII

The "Bleed" Border

MOST advertisers and artists understand, what a "bleed" border is, but many mistakes are made in making up the working drawings so as to give the engraver and printer a chance to accomplish what is intended.

To "bleed" a page does not necessarily mean a bleed border, for there are lots of drawings now-a-days that have no borders. It means, however, that when the page, cover, or whatever it is, is printed and finished, it shows the design (and here design means either background color or any other part of the whole scheme), coming right to the edge of the paper, leaving no white paper margin showing.

No printer could set up a plate, say 4x7 to print on a sheet 4x7 and leave a clean edge, or be able to trim down a stack of booklets just to the edge of the plate, without either cutting into the printed matter or leaving a more or less uneven white margin.

In order to make it practical to have the design end at the clean edge of the page, it is necessary to make the working drawing a little

larger than it will eventually appear. This will allow the printer to trim down both white paper and a little of the printed design to the size originally desired.

Artists should bear in mind that in making a working drawing for a book or booklet, only three sides will bleed, the left-hand side that comes up to the fold of the paper will not bleed.

Opinions differ as to the amount of extra design to draw, so as to allow for bleeding, but the printer can easily set his guillotine to cut off one-eighth of an inch. Of course, the artist must leave the proportionate amount according to the scale of his working drawing, that is, if he is making his drawing twice the size, then he must leave one-quarter of an inch on his drawing or if he is allowing three-sixteenths for the printer to bleed, he must leave three-eighths more on his drawing and so on, according to the scale of his drawing and the amount of bleed allowed the printer.

The advertiser when considering bleed pages must remember that the eighth or three-sixteenth of an inch or whatever it is, must be added to the cost of the plates, and that the printing will cost more as it covers a greater area of plate.

Bleed borders or bleed pages are effective.

CHAPTER XXVIII

Glossary of Terms and Expressions Used by Photoengravers

BACKING—In electrotyping, filling the copper shell with metal to make it solid.

BLACK LEADING—In electrotyping, covering the surface of the form to be molded with black lead or graphite.

BLEED—When an illustration has been cut down or trimmed so closely that the knife has cut into part of the design or border.

BITE—A single period of etching a plate.

BLOCK—An engraved plate when mounted type high.

COPY—Any subject, whether drawing, painting or object, submitted for photo-mechanical reproduction. An original.

CROP—When marked on copy it means that the plate is to be cut off at the line marked near the word "crop."

DIAPHRAGM—Called "stop" by engravers. Used in a lens to increase the sharpness of the image.

DRAGON'S BLOOD—An acid-resisting etching powder.

ELECTRO—Electrotype.

→ *Page Two Hundred and Fifteen*

ENAMEL—The coating on a metal plate which, when carbonized by heat, resists acid.

ETCHING—Engraving by acid corrosion. The engraving thus made.

ETCHING BATH—The acid solution used to produce an etching.

ETCHING INK—Ink made to resist acid.

EXPOSURE—The act of submitting a sensitized surface to the action of the light. Also the time occupied in the act.

FILM—Any thin skin of albumen, collodion, gelatine, fish glue, or any other substance. Usually formed by the evaporation of the solvent.

FLASHING—In half-tone making, exposing with small stop to white paper.

FLAT—The glass on which several negative films are laid close together. The etched plate is also called a flat.

FOCAL LENGTH—Distance of a lens from the ground glass when a most distant object is in focus. Also called a "focus" of a lens.

FOCUS—When the image on the ground glass of a camera is as sharply defined as possible, it is said to be "in focus."

GRAIN—A granular appearance either in a negative or on a metal plate.

GRAVER—A metal tool used in engraving.

HALF-TONE—A printing plate made through a half-tone screen.

HALF-TONE PRINT—A print from a half-tone plate.

HALF-TONE SCREEN—A transparent medium on which are parallel opaque lines single or crossed. Used in photoengraving to break up the shades of an image into dots and lines.

HIGHLIGHT—The brightest portion of a picture, hence the densest part of the negative.

HIGHLIGHT HALF-TONE — A half-tone in which the highest lights are entirely white, without dots.

HIGHLIGHT STOP—The largest stop used in half-tone negative making.

IMAGE—The picture on the ground glass of a camera, on the negative, or on the metal.

IRIS DIAPHRAGMS—Lens stops formed and named after the iris of the eye. They are fixed in the lens and give only circular apertures.

LENS—That part of the camera which focuses the image on the negative.

MORTISE—A space cut out, as in the body matter of an engraving or block, to allow for the insertion of other matter. Mortised type is a type in which some portion that does not print is cut away, so that other letters or brass rules may be inserted.

MORDANT—Any corrosive liquid that can be used to etch metal.

NEGATIVE—When the lights in a subject are shown dark and the darks light. The opposite to positive.

NORMAL STOP—The diaphragm used to photograph the half-tones of the copy in half-tone negative making.

OUT OF REGISTER—When the various colors of a plate or type form do not properly connect, or the color lines of type do not strike in the correct position, they are said to be out of register. The expression is also used when the printing on the two sides of a page of a book or periodical does not exactly match.

POSITIVE—The image on metal. A photographic print from a negative. The opposite of negative.

POWDER—Term applied to a finely ground resin used to resist acid.

PRINT—The positive image produced in a printing frame.

PROCESS CAMERA—The camera possessing a "process lens," used by photoengravers for making process color negatives.

PROCESS WORK—Photoengraving. Generic term given to all the photo-mechanical processes.

REDUCING—Making smaller. The "cutting" solution used to make smaller dots in half-tone negatives.

REPRODUCTION—The act of duplicating by photoengraving. A print made by photoengraving.

ROLLING-UP—Covering a sensitized surface with ink prior to development or during the etching operation.

ROUTING—The gouging or drilling out of the blank portion of the plate to prevent it from blurring the work in printing.

ROUTER—Machine with a cutter revolving at high speed for removing metal not wanted in an engraving.

SCREENY NEGATIVE—One in which the screen lines are too prominent.

SCUM—Transparent film of glue between the dots on a metal plate which prevents etching.

SENSITIZING—The act of making anything sensitive to light.

SHADOW STOP—The smallest stop used in half-tone negative making.

SHOULDER—A ledge of metal left at the side of a line or dot when etching.

STAGING—Stopping out areas of metal plate between etchings.

TOP—Photoengravers' term for the acid resist on a metal plate.

TOPPING POWDER—The first etching powder applied to the ink image.

UNDERCUT—When the etching fluid has eaten beneath the design.

UNDERLAY—In the process of make-ready, a piece of paper or thin card placed under type or cuts to even up the impression.

VIGNETTE—A half-tone engraving which shades off to nothing.

WHIRLER—A machine for revolving a metal plate, so as to give an even coating.

ZINC ETCHING—The act of engraving on zinc with etching fluids. A relief printing plate thus made.

CHAPTER XXIX

A String to Tie Around Artists' Fingers

Reprinted from PRINTERS' INK MONTHLY
Copyrighted by the Romer Publishing Co.

IT is often claimed that artists are very difficult to handle and that they insist upon having their own way, regardless of conditions or preferences of the man who foots the bill.

An amusing list of remarks has been compiled by a well-known art director. This man comes in almost hourly contact with artists of every kind, hands out instructions, and "knows them like a book." Here is his printed list under the title:

"How to Handle Commercial Artists

"Always make a rough composition sketch, showing exactly how the job is to be planned, that is, provided it must be done in a certain way.

"Keep a duplicate of this sketch for evidence.

"Give the artist the size, written out on a piece of paper.

"Write all instructions—never leave them to his memory. He may say: 'Oh, I'll remem-

ber that,' but he won't. Make sure. Write it down.

"Have the technique understood in advance.

"If colors, state how many colors and what colors.

"Ask for the finished work a week in advance of the time it is wanted, for even then it will be late.

"Always call an artist up at his studio well in advance of the time the finished work is wanted.

"Have the price understood and down in black and white.

"Make them show you a rough sketch, working size before they actually complete the drawing. It is the only safeguard."

And now along comes an artist who, having read the art director's list of rules, came back with his own version, applying to a reversed condition of affairs.

Entitled, "How to Handle Art Directors," the artist's list reads thus: "Yes, by all means have the price understood and down in black and white.

"Do not accept an order if there are too many artistic restrictions. They'll make mechanical automatons of you if they get half a chance.

"Make no promise as to the time of delivery. Art can't be ground out as water is run from an open spigot. Say you will do your best and let it go at that. They always have enough time later—for a thousand corrections.

"If a size is given you, insist upon a written duplicate in his handwriting. Even art directors make mistakes themselves.

"By all means submit a working-size pencil layout for O. K. And paint that written O. K. with varnish or cover it with shellac, for they will want everything changed, anyhow, and the O. K. makes it possible for you to charge extra for all the alterations you make."

REPRODUCTION

from the beginning of Time has been the simple task of Nature.... and the intellect of Man. ¶ It has befallen our lot to do our utmost in the

REPRODUCTION

of your thoughts that they may be spread before the masses in a clear and convincing manner. ¶ Into *Composition* of Advertisements of worthy goods we love to pour all that Nature and Experience have endowed us in the way of typographic knowledge and human appeal.

PHILLIPS & WIENES
TYPOGRAPHIC SERVANTS
160 East Twenty-fifth Street New York

NO matter how much worldly knowledge a man may acquire, unless he has acquired sincerity and respect for the finer things of life — Literature, Music, Art and Reverence, he is not educated. Those who earn their living by any one of these finer things are in a unique position to develop ultra-intelligence . . . We are Artists, devoting ourselves not only to the economic demand for something New, but to the deep, inextinguishable longing for something Better!

◆

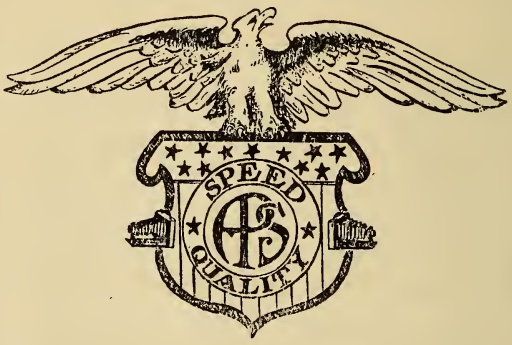
THE LINNINGS

Accredited Advertising Artists

110 West 40th Street, New York City

TELEPHONE BRYANT 9497

"OUR PHOTOS TELL YOUR STORY"



PRICE is the last word in Commercial Photography, but an A. P. S. statement represents the last two words—PROPER PRICE.

We are not in business for just what we can get out of it, but also for what we can put into it. In short, we are worth-while photographers, giving you worth-while pictures for a worth-while price.

We make Motion Pictures, too, and would like to show you some interesting examples of this latest advertising feature.

American Photo Service, Inc.

110 West Fortieth Street **New York City**

Telephone Bryant 0738

look at the cover on this book

finer than leather

wears longer

costs less

MADE BY

WALCUTT BROS. COMPANY

141 East 25th St. New York

WE call your attention to our demonstrations of ECONOMY gained by 20 years' experience in the printing business, and to the spirit of pride we display in our work.

We would like to show you how well we are serving others by proving how well we can serve you.

Small jobs appeal to us just the same as the big ones; in fact many people prefer to give us all their work under certain quantities, knowing that it is PRACTICAL ECONOMY.

ALEX SHEFTEL
High-Grade Job Printing
138 W. 36th St., N. Y. City
TELEPHONE FITZ ROY 3839

PROCESS OFFSET

A Few of its Advantages

1. Realistic reproduction of original copy.
2. Makes possible the printing of fine screen half-tones on rough surfaced paper.
3. Reducing to a minimum the objectionable mechanical formation of the half-tone screen.
4. More faithful reproduction of color work with fewer colors than by lithography.
5. Quality of adding "depth" to reproductions, due to opportunity of using Antique paper.
6. More artistic effects possible on unusual stock.
7. Easy means of duplication of plates without the expense of electros.
8. Practically eliminates expensive overlays and make-ready.
9. Adds "texture" and "feel" to black and white as well as to color work.
10. Cost? In many cases cheaper than printing.

ANDREW H. KELLOGG CO.
141 to 155 East 25th Street
New York City

PIONEER PRODUCERS OF PROCESS OFFSET

Composition and Press-
work on this edition by the
BLANCHARD PRESS
Incorporated
418-428 West 25th Street
NEW YORK

H 55 85

HECKMAN
BINDERY INC.
NOV 84
N. MANCHESTER,
INDIANA 46962

LIBRARY OF CONGRESS
0 021 183 056 6